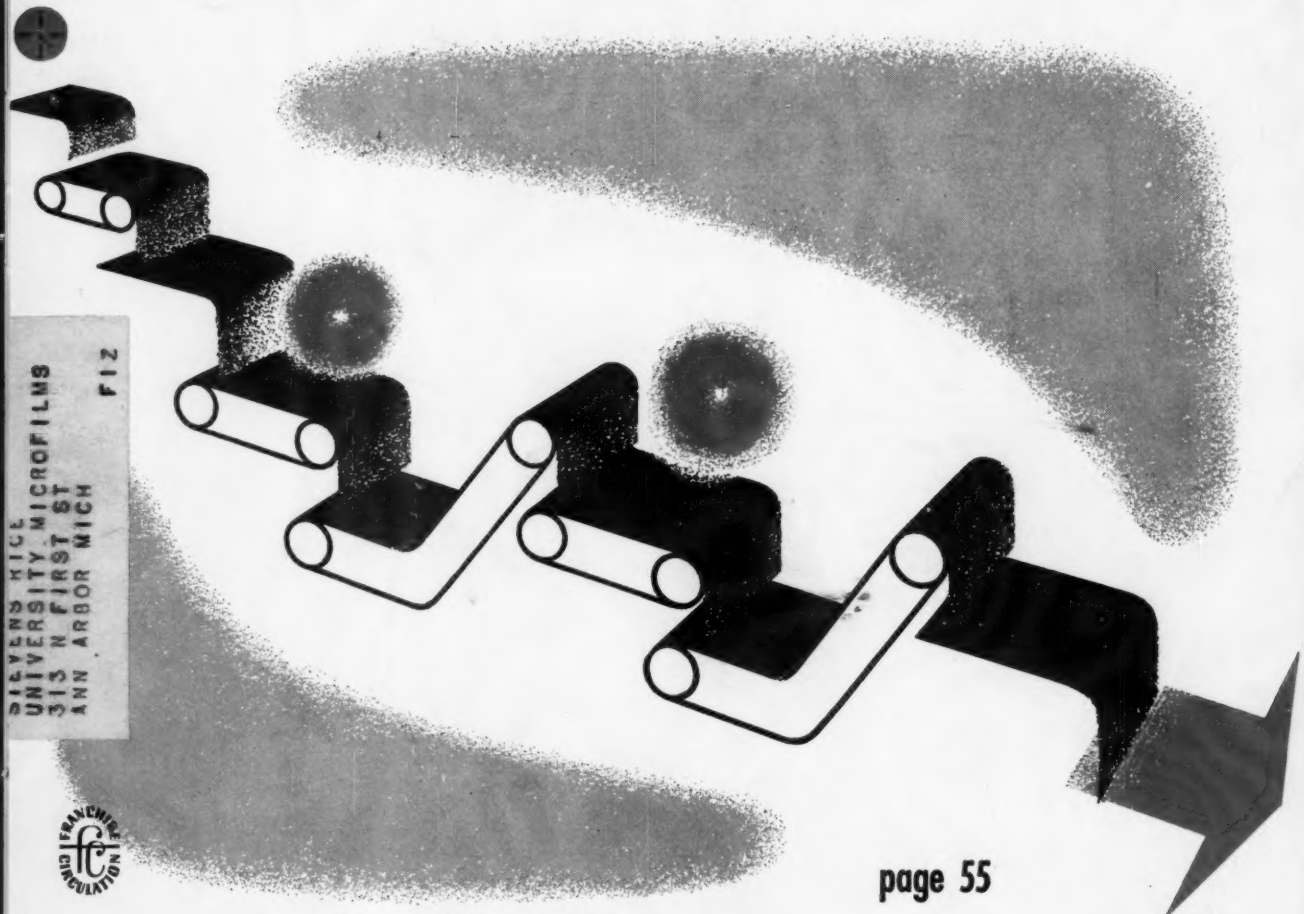
MATERIAL HANDLING

FLOW

PRODUCTION · AUTOMATION · PACKAGING · SHIPPING

JANUARY 1957



STEVENS MICL
UNIVERSITY MICROFILMS
313 N FIRST ST
ANN ARBOR MICH
FIZ

FRANCHISE CIRCULATION

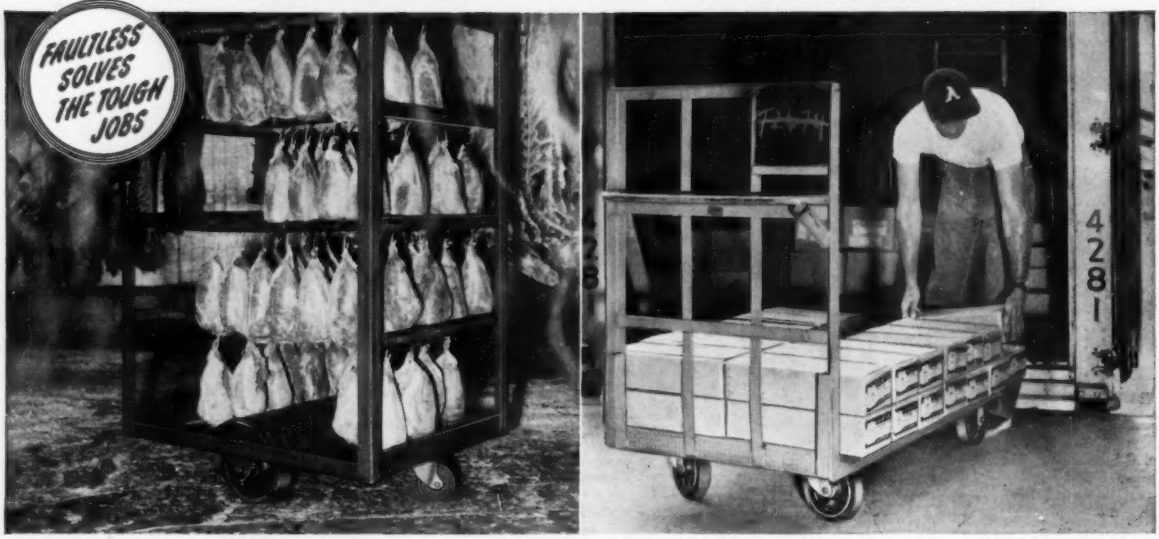
page 55

Trend Complete Mechanization of Heat Treating

• More than 40,000 buyers are reading this issue for help with their handling and packaging problems.

Faultless CASTER MATERIALS HANDLING FACTS

FROM SMOKE ROOMS TO BUSY FREIGHT TERMINALS . . .



FAULTLESS GREASE SEALED CASTERS PROTECT PRODUCTS AND COSTS

SERIES 900GS CASTER
Cut-away to show grease sealed double ball bearing swivel.

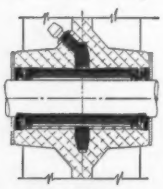
LEAK-PROOF NEOPRENE RETAINER MOLDED AND VULCANIZED ON UPPER BEARING SWIVEL RACEWAY. PATENT PENDING.

THRUST BEARING GREASE RETAINER TIGHTLY FITTED AROUND FORMED, HARDENED RACEWAY. CAN BE EASILY REMOVED FOR CLEANING OR INSPECTION.

Washers with Neoprene are press-fitted into hub. The Neoprene cross section reveals area provided to lock grease against leakage and to assure free running wheel.

Packing house temperature extremes of 0°F to 200°F, brine and steam, do not affect the triple-sealed bearings of Faultless 900GS Casters. A Neoprene retainer surrounds, and is vulcanized to, the upper swivel bearing raceway. A permanent film of grease, between the Neoprene retainer and top-plate, greatly reduces friction—accelerates swiveling—minimizes "down-time" and plant interruptions by sealing out water, dirt, chemicals, etc.

Freight and production lines move faster when permanent Caster lubrication assures easy rolling and swiveling. No grease can drip, floors are clean and safe. More loads can be moved by one man.



NEOPRENE HUB SEAL
Heavy Neoprene seal is formed around metal washer to lock grease within roller bearing.

Your nearby Faultless Industrial Distributor maintains a substantial inventory of Faultless Casters for immediate delivery. Call him today!

Dept. F1

FAULTLESS CASTER CORPORATION
EVANSVILLE 7, INDIANA

Offices in Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, New Orleans, New York, Philadelphia

Circle No. 31 on Reader Service Card for more information

Best for the **Heavyweight** jobs

SMOOTH-SOLID TIRE
–for factory, warehouse and loading platform

ALL-WEATHER TREAD SOLID TIRE
–for ramps, wet surfaces and other extra-traction conditions

GROOVED TREAD SOLID TIRE–built to take heavy punishment on big trucks

ALL-SERVICE TREAD XTRA CUSHION SOLID TIRE
–built with compact lug design for fast, easy rolling with maximum smoothness and stability

If you use heavy-duty equipment like this, specify Goodyear Industrial Tires – and you're on your way to better tire performance – longer tire wear. And the reason can be summed up in three words: "They're job-fitted."

When your Goodyear Dealer is asked for his recommendations, he not only fits the tire to the truck – he fits it to the job – by size, by tread design, and with the right rubber compound.

So if you want your Industrial Tires to come through with a performance on heavyweight jobs that can't be beat – call your Goodyear Dealer. Or you can write: Goodyear, Industrial Tire Sales, Akron 16, Ohio.

USE THE RIGHT TIRE FOR THE JOB – BUY AND SPECIFY

GOODYEAR

INDUSTRIAL TIRES

All-Service, All-Weather, Xtra Cushion–T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

See "THE GOODYEAR PLAYHOUSE"–TV–Sunday 9-10 E. S. T.

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MIDDLEWEIGHT CHAMP

THE AMERICAN Safeway

PORTABLE ELEVATING TRUCK

MORE "MIDDLEWEIGHT" MOVING... MORE EASILY... AT LESS COST...

Here, at last, is the ultimate in modern, efficient moving and lifting of middleweight loads . . . yours at a fraction of the original and upkeep costs of fully-motorized lift trucks.

With an American Safeway Portable Elevating Truck, one man can do the work of many on loads up to 1,500 lbs. Operating expenses are far lower, no fuel to buy, no gasoline pumps to install, no costly battery rechargers. No expensive operators, because *anyone* can run an American Safeway! Best of all, *the work gets done faster and more efficiently than ever before.*

Each of the 21 versatile models of this great new line handles easily—maneuvers in narrow spaces like the Champ that it is. They're available now with pedal-operated or battery-powered lift mechanism, straddle or non-straddle design, with fork, platform, or drum-stacker hoisting device. Ask for a demonstration, *today!*

Write for Catalog HE-56

Products of

AMERICAN

LOAD-LIFTS

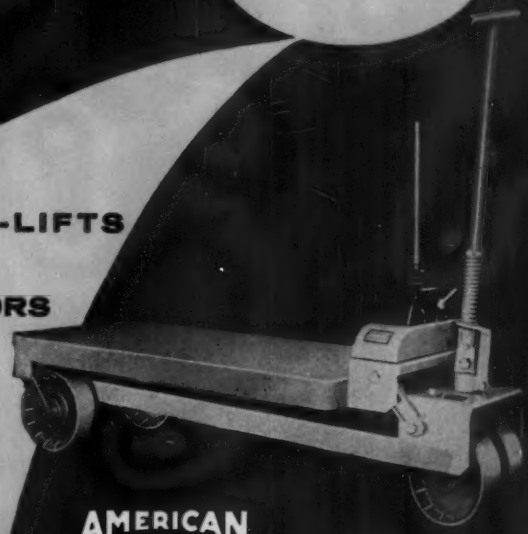
LOAD-VEYORS

AND AMERICAN'S NEW LOAD-LIFTS FOR SKIDS AND PALLETS... LOAD-VEYOR GRAVITY CONVEYORS

Now, from the same source as world-famous American Pressed-Steel Hand Trucks and Portable Elevating Trucks come these three new devices to help you speed your middleweight moving.

AMERICAN SKID LOAD-LIFT TRUCK—No more flying handles because there is no mechanical or hydraulic connection between the pulling handle and the lifting mechanism. Straight-line, double-acting power-strokes. Only 30 pounds effort on the lift-handle required. Smooth rounded corners, and cargo deck combine with arc-welded frame to give simplicity and safety when handling loads up to three tons.

AMERICAN PALLET LOAD-LIFT TRUCK—Sizes to handle single or double-faced pallets with loads up to 6,000 pounds. The forks enter and leave the pallet easily. Large-diameter front wheels and close-centered tandem-articulated rear wheels roll easily and cross over floor obstructions. Truck can not be cornered; will lift wherever a man can stand; only 30 pounds effort required.



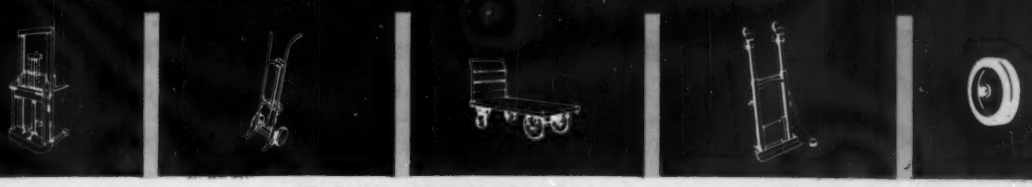
AMERICAN LOAD-VEYORS

American Load-Veyors combine greater strength with lightest weight to provide a gravity wheel conveyor with an exclusive zig-zag grid construction which offers maximum wheel support. The side-rail arrangement enables you to move large packages on one side, and by inverting each section, small packages may be moved within the side-rails, eliminating danger of fall-off.

Write for Catalog HM-56

The American Pulley Company

PHILADELPHIA 29, PENNSYLVANIA



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Now Baker gives you Balanced Design in an all new 2000 lb. gas fork truck

This newest addition to Baker's outstanding line of gas-powered fork trucks now completes the range of models from 2000 to 7000 lbs. Like its companions it features Baker *Balanced Design*, with all elements coordinated to work together for top efficiency, maximum dependability and longest life.

For greatest operator convenience and safety it features absence of cowl and offset driver position for better visibility . . . recessed seat for lower driver silhouette . . . unobstructed access for mounting from either side . . . effortless automotive steer . . . self-adjusting, self-energizing and self-equalizing hydraulic brakes.

Actual turning radius of this sturdy compact truck is only 61½ inches . . . it operates in 57-inch intersecting aisles. Total lift 130 inches . . . lifting speed 45 FPM, lowering 65 FPM . . . travel speed 8 MPH forward, 7 MPH reverse —all with full load. Mast tilts 10° forward or back.

Baker industrial trucks

THE BAKER-RAULANG COMPANY

1219 WEST 80th STREET • CLEVELAND 2, OHIO

A Subsidiary of the Otis Elevator Company

Otis

6G3

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JANUARY 1957
VOL. 12, NO. 4

FLOW

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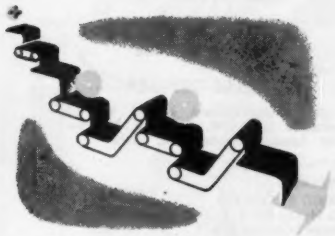

THE COVER

How mechanized heat treating equipment is effectively pointing the way to automation in the heat treat shop.

FLOW is published monthly by The Industrial Publishing Corporation, 812 Huron Road, Cleveland 15, Ohio, which also publishes:

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FLOW'S MATERIAL HANDLING ILLUSTRATED
PRECISION METAL MOLDING
APPLIED HYDRAULICS
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OCCUPATIONAL HAZARDS
COMMERCIAL REFRIGERATION AND AIR CONDITIONING
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AERONAUTICAL PURCHASING

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United States and possessions—$5.00 per year, $8.00 for 2 years. Subscriptions in the United Kingdom: £2.5 per annum, payable in Sterling to our London Office.

Foreign—$7.00 per year.

Canada—$6.00 per year.

Single copies—1-10—$.50 each, 11-25—.40 each. Over 25—.35 each. Canada—.50 each. Foreign—.60 each.

BPA

FLOW is indexed regularly by Engineering Index, Inc. "Accepted as Controlled Circulation Publication at Pontiac, Illinois." Please return 3579 forms to 812 Huron Road, Cleveland 15, Ohio.

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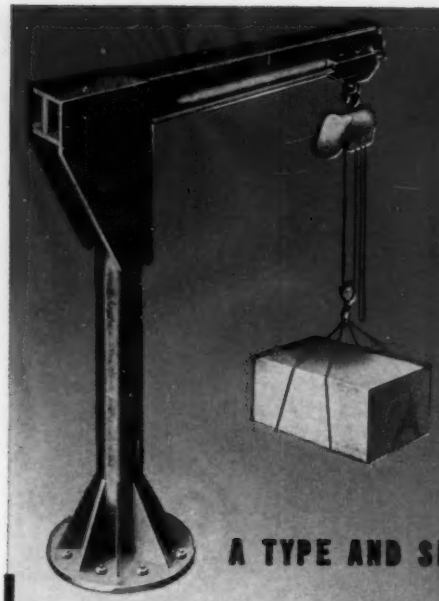


CHICAGO TRAMRAIL

JIB CRANES

engineered for easier handling and long years of service

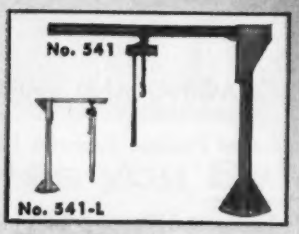
A TYPE AND SIZE FOR EVERY NEED

No. 539—Wall Bracket Type with 180° Rotation. Equipped with bronze bearing mounted in machined steel castings for accurate alignment and ease of rotation. Capacities 1,000 lbs. to 10,000 lbs. Lengths to 25 ft.

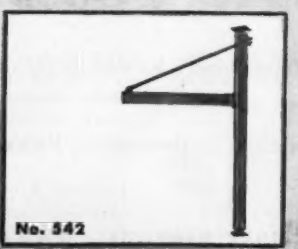
No. 540—Self-Supporting Jib Crane with 220° Rotation. Bronze bearing in machined steel casting. Self-supporting column supplied with either bolted or imbedded base. Capacities to 10,000 lbs. Spans to 20 ft.

No. 541—Self-Supporting Jib Crane with Complete 360° Rotation. Outstanding features include: machined steel bearing band welded to column to assure concentricity; four load carrying rollers with needle bearings mounted in head in machined cast steel trunnions; precision thrust bearing mounted in top of column to carry vertical load; two adjusting screws for leveling boom. May be equipped with collector rings for power supply for continuous rotation. Capacities to 10,000 lbs. Spans to 20 ft.

No. 541-L—New Light Duty Free-Standing Jib Crane with 360° Rotation equipped with full floating roller bearings. Ideal for mounting on machine tools. Capacities 250 lbs. and 500 lbs. Spans 6 ft. to 16 ft.



No. 542—Mast Type Jib Crane with 180° Rotation; top and bottom supports. Bronze top bearing and tapered precision roller bottom bearing insure easy positioning without drifting. Capacities to 6000 lbs. Spans to 20 ft.



Write for complete Jib Crane Catalog showing applications, charts and dimensions. A valuable guide to the selection of jib cranes. Send promptly upon request.

CHICAGO TRAMRAIL CORPORATION

1322 SOUTH KOSTNER AVENUE

CHICAGO 23, ILLINOIS

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FLOW

Published by
The Industrial Publishing Corporation
812 Huron Rd.
Cleveland 15, Ohio

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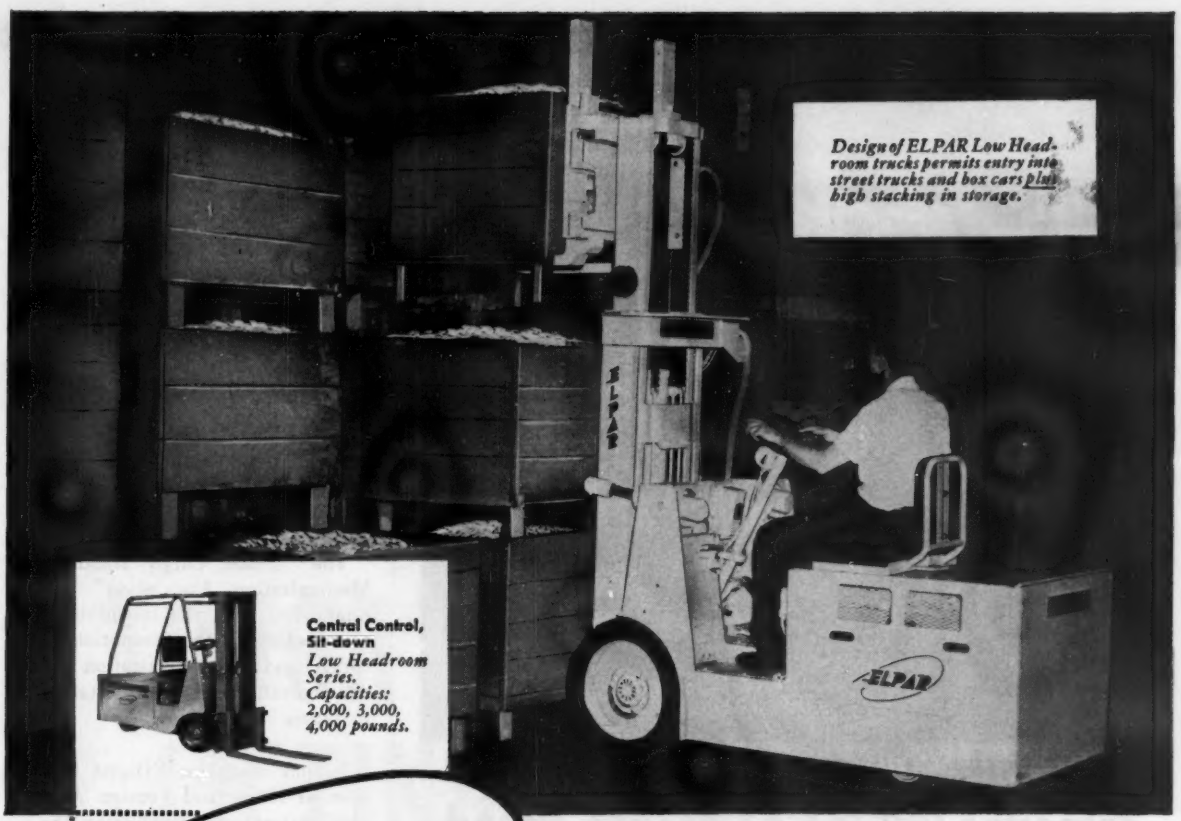


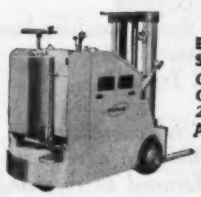
Design of ELPAR Low Headroom trucks permits entry into street trucks and box cars plus high stacking in storage.

Central Control, Sit-down
Low Headroom Series. Capacities: 2,000, 3,000, 4,000 pounds.

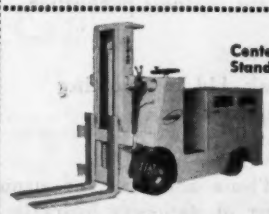
ELPAR® FORK TRUCKS

ALL types for *ALL* needs

Central Control, Sit-down
Air Right Series. Nine models, capacities from 2,000 to 10,000 pounds.



End Control, Stand-up
Cargo Scouts. Capacities: 2,000, 3,000 pounds.



Center Control, Stand-up
In several capacities to 10,000 pounds.

Choose the exact fork truck you need from the complete ELPAR line. There are sit-down and stand-up, central and end control models in many capacities. And they can be specially adapted or equipped with attachments to handle "problem" loads.

ELPAR trucks are electric-powered to provide quiet, fume-free operation at a cost of only pennies per day. They are built to last; over 90% of those made since 1925 are still in use. As a *no-cost* extra, Elwell-Parker field engineers advise your men on proper preventive servicing . . . a free, personalized service that adds many years of truck life.

Follow the example of 75% of the 100 largest U. S. manufacturers: pick the *right* truck for your material handling . . . choose an ELPAR!

Write Today for General Catalog

THE ELWELL-PARKER ELECTRIC CO.

4231 St. Clair Avenue • Cleveland 3, Ohio

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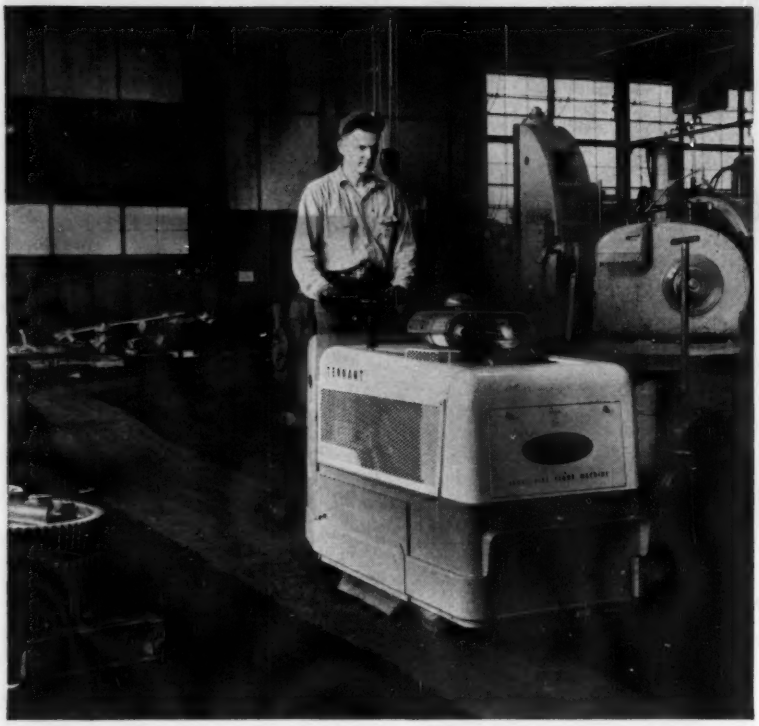

1 man, on a TENNANT "L" Floor Machine...

removes 140 lbs. of grease-caked dirt in 22½ minutes

As he rides down this aisle on a TENNANT "L" Floor Machine, this man is doing a job you'd think was "impossible."

With no effort except to steer and use simple hydraulic controls, he's cleaning a 21" path . . . smoothly shaving off bumpy traffic-packed dirt at the rate of 140 lbs. in 22½ minutes.

That's a *ton* in less than 5½ hours!

CLEANS FLOOR IN 1 OPERATION

You see the results at the right. In one operation the machine's 1600 rpm cleaning cylinder *pulverizes* hard-packed dirt—then picks it up.

Provides a superbly clean floor at a rate 6 men couldn't equal by hand—a hard, dry, good-trucking surface that wheels can grip without wasted power or lost traction.

WRITE for illustrated bulletin, photos, performance data, traction-test results, etc. Smaller walk-behind machine available for congested areas.

BEFORE: Dirt build-up 1/16" to 1/8" thick wastes power, grabs wheels. Truck needs 28-lb. pull to keep moving.

AFTER: Cleaned by Tennant "L", floor is smooth and dry. Lets truck move with 9-lb. pull—1/3 the effort needed before.

G. H. TENNANT COMPANY, 707 N. Lilac Drive, Minneapolis 11, Minn.

TENNANT FLOOR MACHINES

SPECIALIZED MAINTENANCE EQUIPMENT

POWER SWEEPERS • FLOOR MACHINES • SCARIFIERS • ROOF SCRAPERS • CONCRETE ROUTERS

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LETTERS TO THE EDITORS

Articles to Japan

To FLOW:

I offer you my sincerest felicitations for the development of your magazine, which all of us are always reading with great interest and expectation.

The "Japan Cargo Handling Mechanization Association" was established with the intention of contributing to the promotion of cargo handling mechanization and rationalization of transportation in Japan.

In our magazine "Digest Column of Home and Foreign Articles" is set up to enlighten the members, and we wish eagerly to insert a summary of useful articles concerning the cargo handling mechanization published in your magazine.

The actual matter being as mentioned above, if you could permit us to introduce in short digest the papers printed in your publication, your courtesy and kind consideration would be high appreciated by all members of the association.

In case you would favor us with this benevolence, we would hereafter send you every number of our magazine.

Toru Akiyama
Japan Cargo Handling Mechanization Association
Tokyo, Japan

FLOW is honored indeed to comply with such a request, and we look forward to receiving copies of the Japanese publication.

Seek Aid in Locating Suppliers

To FLOW:

Please advise us the manufacturer of stationery hydraulic ele-

SHOW ME YOUR TOUGH LIFTING JOBS!

Here's the hoist to handle them in a hurry. It's the 'Budgit' Aluminum Chain Block. Talk about easy pull; this hoist really has it. One man can lift a 500 lb. load with only 25 lbs. of muscle effort. The ½-ton size weighs only 29 lbs. Easy to carry anywhere a fast lift is needed.

The 'Budgit' Aluminum Chain Block takes hard knocks because super-strength is built into every part from top hook to load hook. Extra safety and efficiency is provided by the big "full jeweled" load brake. It's a fast-acting, automatic brake that makes lowering so smooth and easy loads can be "spotted" with hairline accuracy.

Put the money-saving advantages of the 'Budgit' Aluminum Chain Block to work for you. Spark-resistant models are available for use where such a safeguard is essential. Capacities: ¼ to 10 tons. *Call your nearby "Shaw-Box" Distributor for details or write us for Bulletins 405 and 415.*

I-Beam Trolleys, equipped with ball bearing wheels are available in standard and spark-resistant designs. Plain and hand geared types. Capacities to 20 tons.

Safety Hooks are available to "lock in" slings and other attachments used to support loads. All capacities.

Carrying Case. Heavy canvas riveted to sturdy base plate. Has zipper and leather handle. For 'Budgit' Aluminum Chain Blocks up to 1 ton.

57C-4C

MAXWELL M&M MANNING & MOORE INC. TRADE MARK

***'Budgit'*® CHAIN BLOCKS**

MANNING, MAXWELL & MOORE, INC.
SHAW-BOX CRANE & HOIST DIVISION
366 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario*

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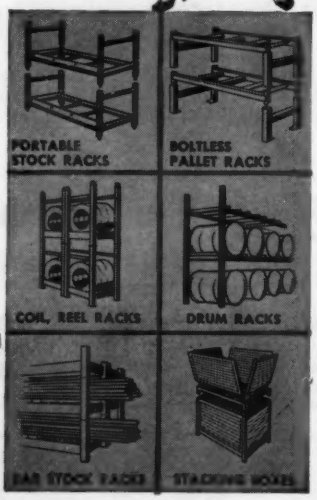
Equipment Manufacturing storage racks that stack, cut time and handling costs, protect workers and stock, and speed inventory.
E.M.I. racks are made of strong, welded tubular steel and are adjustable to fit any space or unit load. Special racks designed to your specifications. Field engineering service on any installation.
Before you decide on a new warehouse, additional storage space or the purchase of stacking equipment write for our new catalog.

Write for our new Catalog



EQUIPMENT MFG. INC.

21552 HOOVER ROAD • DETROIT 5, MICHIGAN
Materials Handling Equipment Stacking Racks for Industry

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LETTERS

Continued

vators, side-walk type with self-closing walk-over doors.

Your help in this regard will be sincerely appreciated.

J. D. Sartwelle
Port City Packing Company
Houston, Texas

To FLOW:

Would you please send us the names and addresses of manufacturers of spiral sliding chutes to be installed in multi-story warehouses for gravity sliding of materials from the upper to the lower floors.

E. L. Davis, Jr.
Atlas Supply Company
Winston-Salem, North Carolina

Both readers Sartwelle and Davis have been forwarded the information as requested.

Aids to Education

To FLOW:

I am writing my thesis on belt conveyors, and would appreciate any material which you might have.

I would appreciate your sending me recent summaries of technical manuals, bulletins and catalogs.

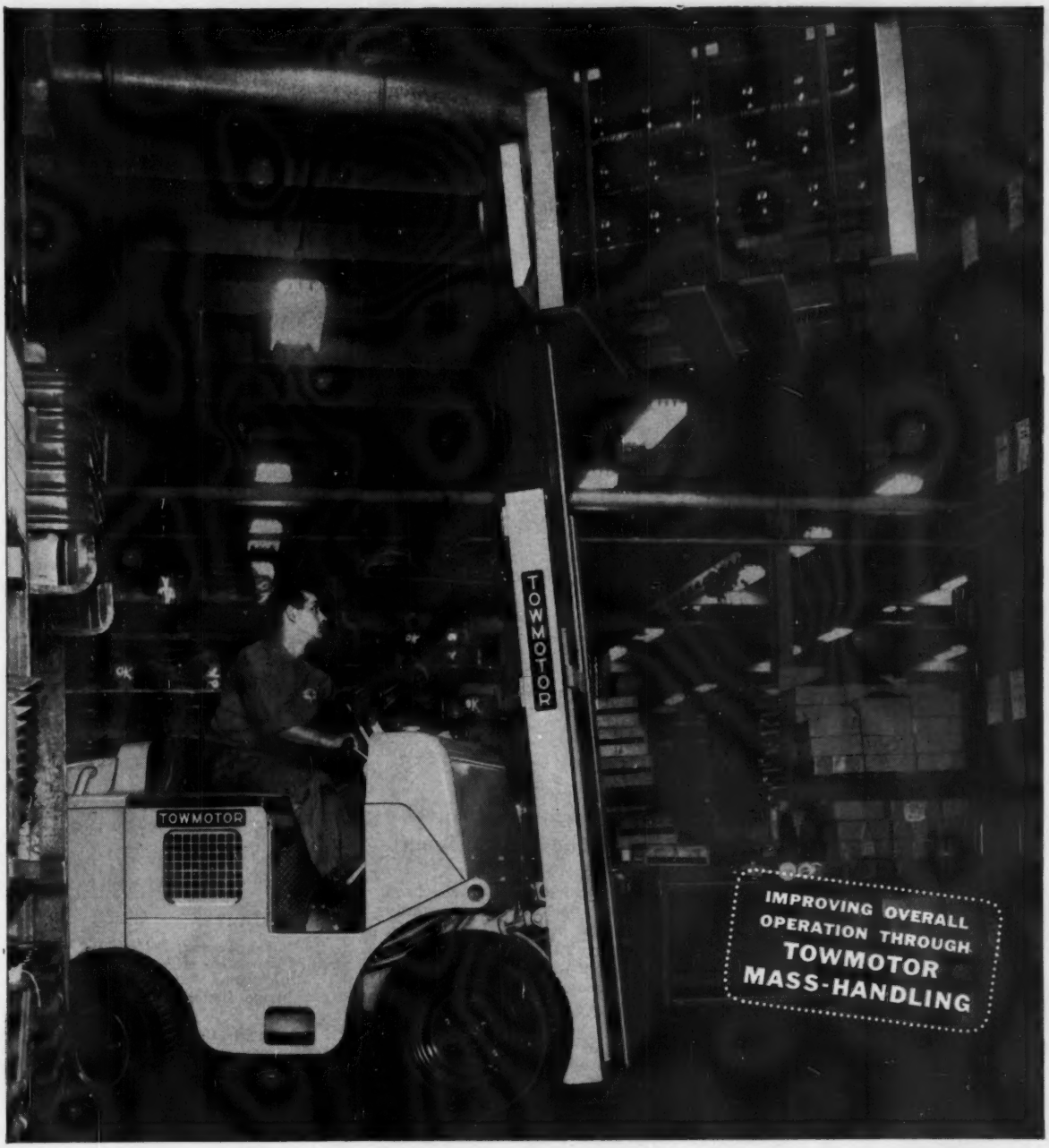
John W. Bonge
Princeton University
Princeton, New Jersey

To FLOW:

I am a student at the New York State College of Forestry and am writing a report on converting a retail lumber yard from manual to mechanized operations. I would greatly appreciate your sending me any reprints of articles which have been run on the mechanization of lumber yards in your magazine. Thank you!

Fred Hallahan
New York State College of Forestry
Syracuse, New York

FLOW is pleased to cooperate in the name of education. All pertinent material that is available has been sent to students Bonge and Hallahan.



...new yardstick for measuring profits!

Towmotor Mass-Handling—moving more units faster, at lower cost—can well be the investment that promises greatest improvement in your future profits, as you face continually rising costs and a shrinking manpower pool.

Integrating Towmotor lift trucks in your departmental operations lets you *supplement* your personnel without adding to your payroll. Enables your men to do a bigger day's work *easier*. Sends them home *fresher*. Permits each one to handle jobs you'd pay a *crew* to do!

Have you seen the new Towmotor lift trucks lately? They offer a wealth of "first-time" features such as:

- Fatigue-free adjustable seating
- Motion-saving "centralized control"
- Maximum free lift that tops all
- No-loss hydraulic lifting action
- Power steering that saves 80% of operator's efforts

Get Bulletin SP-23 on new Towmotor lift trucks from Towmotor Corporation, Cleveland 10, Ohio.

Leaders for 38 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR® THE ONE MAN GANG — GERLINGER

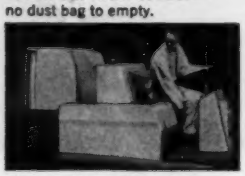
Gerlinger Carrier Company, Dallas, Oregon, is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

Circle No. 128 on Reader Service Card for more information

Wayne Electric Sweeper

with Two Motors... one for travel, one to power brushes and vacuum

"Filter-Vac" Dust Control— no dust bag to empty.



5-Second Power Dumping— at rear of sweeper.

Powered For Grades— geared for better sweeping.

- **Chain Drive**—better traction, maneuvering safety.
- **Balanced Weight Distribution**
- **Lower Center of Gravity**

Here's the kind of power sweeper you have been waiting for... noiseless, fumeless, and with truly advanced engineering and performance features.

With a Wayne you use only the amount of power required for the function the sweeper is performing at any one time. One motor for traveling. Both motors only when the sweeper is traveling and sweeping.

There is no excessive power drain with a Wayne, no rapid battery deterioration because of required heavier charges.

Wayne's 3-speed transmission (no other sweeper has it!) provides a correct gear ratio for maximum operating efficiency under every sweeping condition... even up steep grades.

Every feature has been *proved superior* in hundreds of plants on Wayne gasoline and LP gas powered models. No other make cleans so quickly, so completely, so quietly, as this new Wayne Electric... *the most efficient and safest sweeper built!*

See the WAYNE Electric in Cleveland
at the 8th National Plant Maintenance and Engineering Show, Jan. 28-31. Booth 1052

WAYNE POWER SWEEPERS

WAYNE MANUFACTURING CO.
1214 E. Lexington Ave., Pomona, Calif.
☐ Please arrange for a demonstration of the new Wayne Electric Sweeper. ☐ Please send me literature.
Name_____
Title_____
Company_____
City_____ Zone_____ State_____

World's Largest Producer of Power Sweepers for Cities and Industry

Circle No. 116 on Reader Service Card for more information

CALENDAR OF EVENTS

January 15-17
Caster and Floor Truck Manufacturers' Association Meeting
Hotel New Weston
New York, N. Y.

January 27-29
10th Semi-Annual Meeting—National Wooden Pallet Manufacturers Assn.
Hollywood Beach Hotel
Hollywood, Florida

January 28-31
Plant Maintenance & Engineering Show
Cleveland Public Auditorium
Cleveland, Ohio

January 31—February 1
58th Annual Meeting—National Wooden Box Association
Boca Raton Hotel
Boca Raton, Florida

February 16-19
Golden Anniversary Exhibit—Canning Machinery and Supplies Association
Conrad Hilton Hotel
Chicago, Illinois

March 16-18
Annual Meeting, Folding Paper Box Association of America
Drake Hotel
Chicago, Illinois

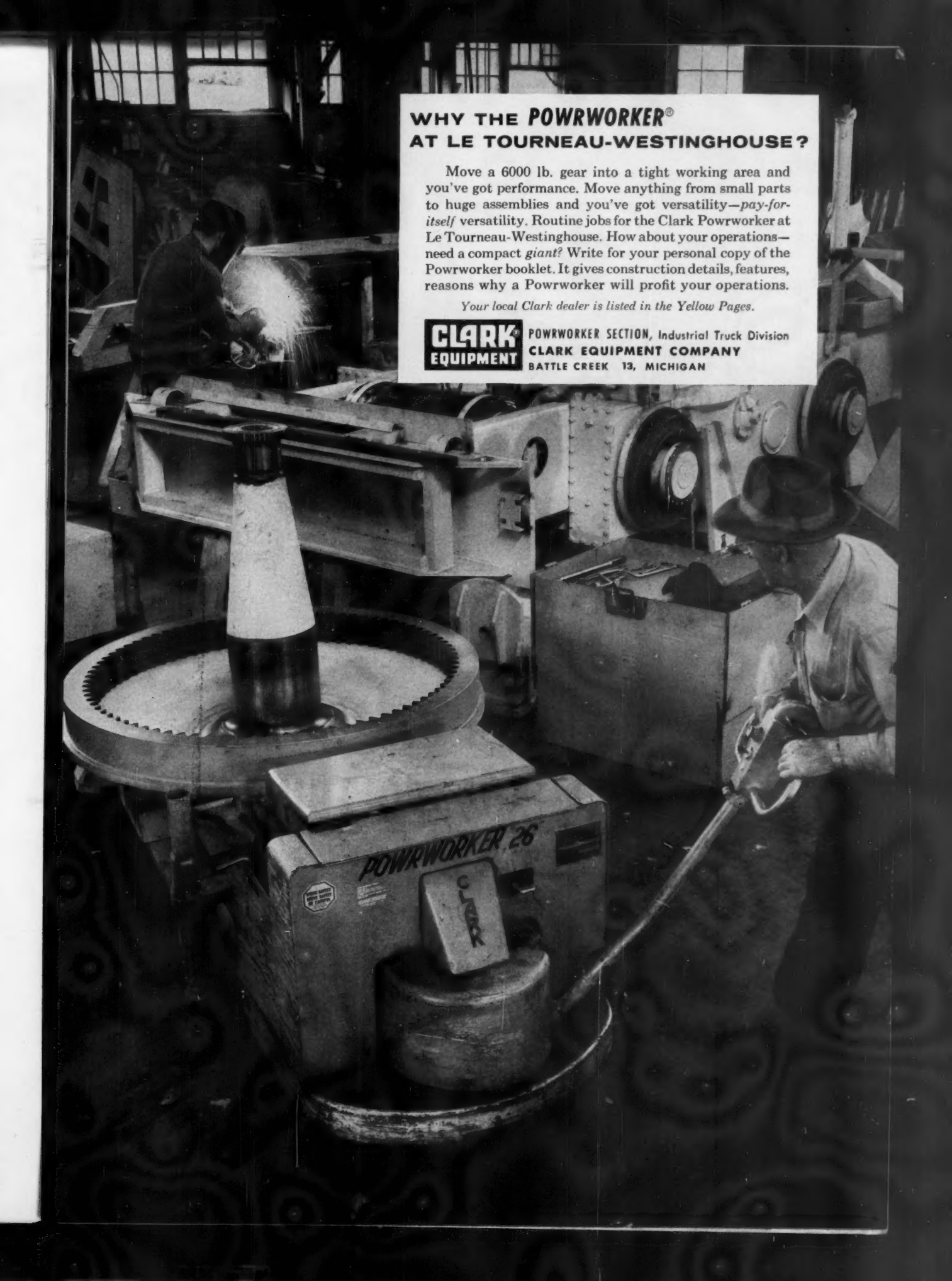
April 9
Directors' and Membership Meeting—Material Handling Institute, Inc.
Edgewater Beach Hotel
Chicago, Illinois

April 9-11
Caster and Floor Truck Manufacturers Association Meeting
The LaSalle Hotel
Chicago, Illinois

April 16
Spring Meeting—Association of Lift Truck and Portable Elevator Manufacturers
Edgewater Beach Hotel
Chicago, Illinois

April 26-27
Annual Convention Meeting—Material Handling Equipment Distributors Association
Chalfonte-Hadden Hall Hotel
Atlantic City, New Jersey

FLOW
Circle 22 on Reader Service Card



WHY THE *POWRWORKER*® AT LE TOURNEAU-WESTINGHOUSE?

Move a 6000 lb. gear into a tight working area and you've got performance. Move anything from small parts to huge assemblies and you've got versatility—*pay-for-itself* versatility. Routine jobs for the Clark Powrworker at Le Tourneau-Westinghouse. How about your operations—need a compact *giant?* Write for your personal copy of the Powrworker booklet. It gives construction details, features, reasons why a Powrworker will profit your operations.

Your local Clark dealer is listed in the Yellow Pages.

CLARK® EQUIPMENT

POWRWORKER SECTION, Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK 13, MICHIGAN

Working docks of a rail-truck terminal, a powerful Clarklift scoots up a ramp. Said management: "Best demonstration of a fork truck we've seen yet. Even more impressed are the men who drive the trucks . . . and to us that's important."

HERE'S WHAT CHICAGO THINKS OF THE NEW CLARKLIFT

Over 35,000 freight cars roll into Chicago daily; 12,000 trucks deliver to 500 terminals. Within this market place of the nation, thousands of companies are pitting smart business sense against the problem of moving materials at the lowest possible cost. Already many of these companies are benefiting from the new performance standards possible with Clarklift.

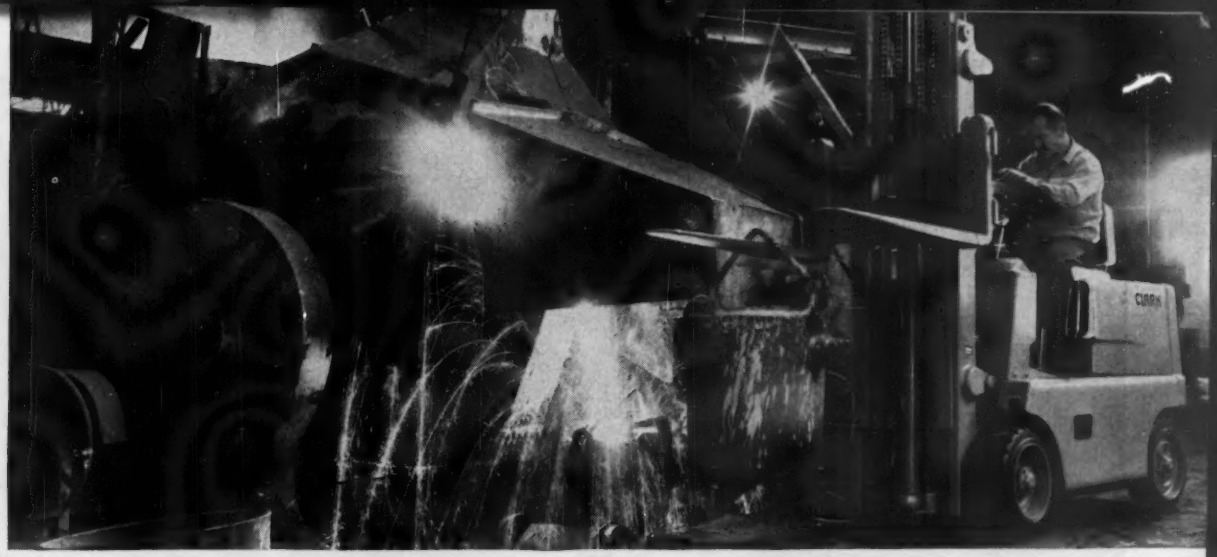
Clarklift is exciting news to men whose business is to wrestle with costs. Said one plant engineer: "We know how to *manufacture* on a close margin; we must *handle* material as profitably. From what I've seen, this new Clarklift truck of yours is going to make news about cutting this overhead burden." A company president: "My engineers thought so highly of this Clark truck's possibilities that they asked me to watch a demonstration. At first glance its styling impressed me . . . but after seeing it work, I am doubly impressed by its efficiency of operation."

These are men who are responsible for controlling one of the world's largest concentrations of materials movement. Many of Chicago's progressive companies *know* the Clarklift. How about you? For details call your local Clark dealer, or write us direct.

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 13, Michigan

CLARK® EQUIPMENT

CLARKLIFT is a trademark of Clark Equipment Company



Clean air cools the engine. Clarklift's exclusive air-scoops work seat high . . . don't pull air off the floor, vacuum-cleaner fashion. Five internal filters and a special radiator screen keep working parts clean—ridding industry of a major problem. Said one foreman: "Biggest problem of a foundry is keeping grit out of working equipment. This Clarklift is the answer."

"This truck is a snap—most accessible I've ever seen. Swing back the hood and you've got the whole motor in front of you. So far I've only done some preventive maintenance, but here's the gimmick; with this truck it's easy."

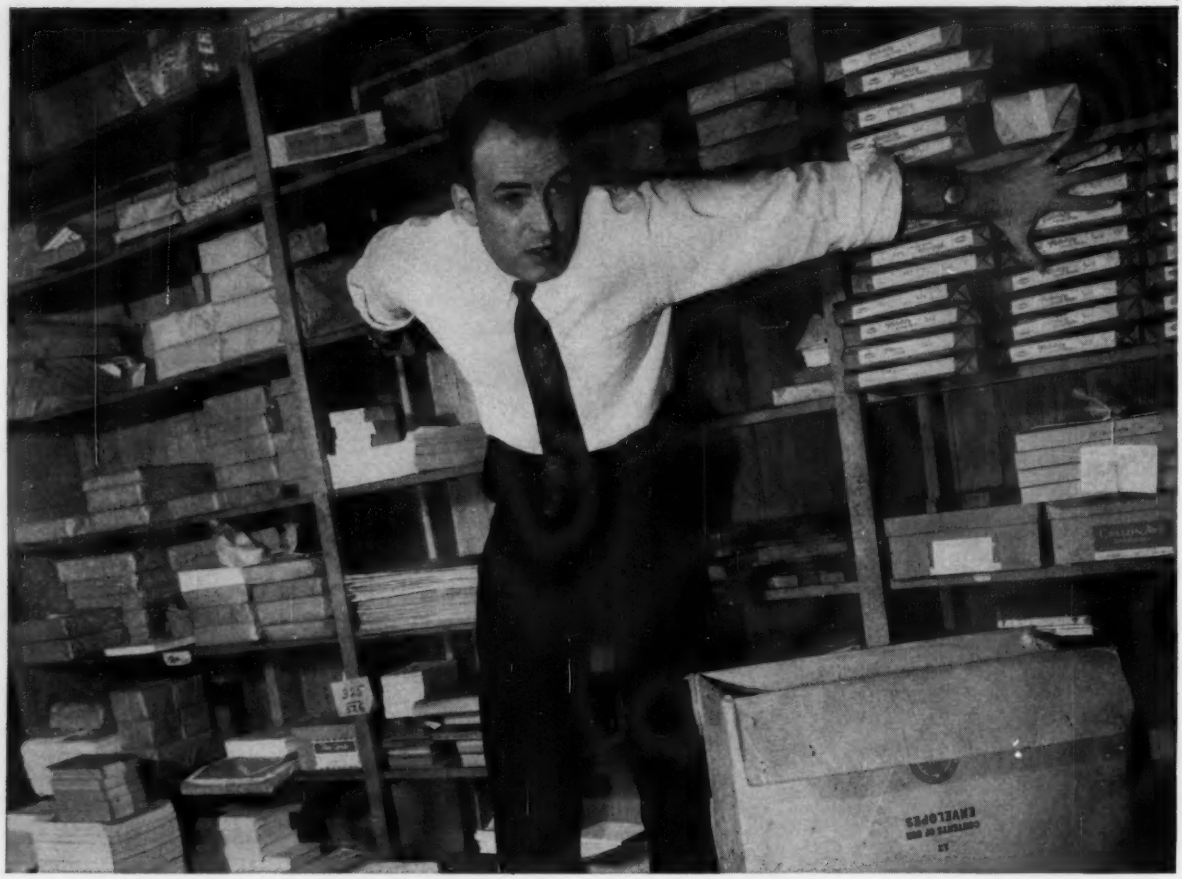
"Close quarter inching, sensitive brakes, good visibility, economy of operation, driver comfort . . . these are important factors which we considered when we bought our Clarklifts," said a plant manager. "We're more than satisfied—are ordering two more."

"Drives like my car. From the size of this truck you might think it was hard to handle. With power brakes, power steering and no clutch pedal—it's a cinch."

"After driving fork trucks for 11 years, I can *feel* the difference. This truck is easier to drive, more comfortable, a lot easier on me. It's not only easier, but I'm getting more work done."

Circle No. 21 on Reader Service Card for more information

QUICK! *"Call the Deluxe Dealer— we have a shelving problem!"*



There's a Deluxe Steel Shelving dealer nearby, ready to give on-the-spot shelving layout service. He will engineer efficient, flexible shelving installations and supply you with additional shelving racks as fast as you need them! Deluxe dealers are backed by the finest designed and sturdiest built shelving.

Only Deluxe combines *all* these steel shelving features:

1. One-piece bin type uprights—for greater rigidity, faster erection
2. Boltless adjustable shelf brackets—complete adjustability without tools
3. Snap-in dividers—for quick flexibility
4. Factory embedded shelf reinforcing—to cut down installation time
5. Coped shelf corners increase storage capacity

These features allow you to install Deluxe shelving at lowest cost.

DELUXE
STEEL SHELVING

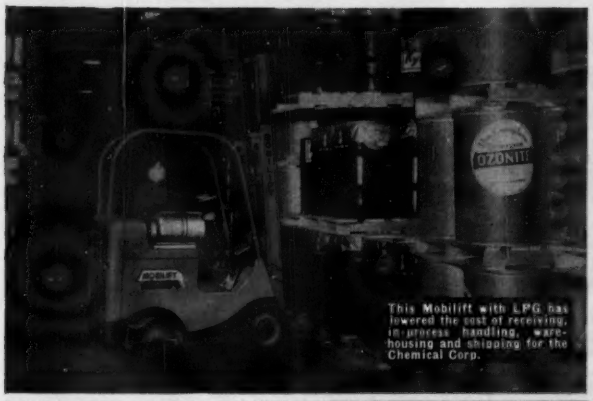
Look for your Deluxe dealer under Shelving in the yellow pages of your telephone directory or write to the factory for the name of the dealer nearest you and the complete 56-page colorful "Shelving Reference Manual."

DELUXE METAL FURNITURE COMPANY • WARREN, PA.

A Division of the Royal Metal Manufacturing Company

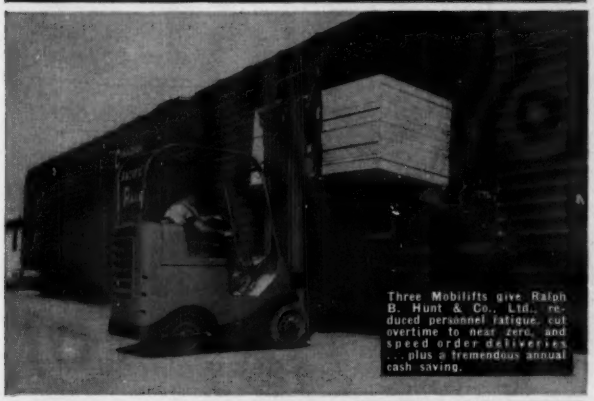
Circle No. 123 on Reader Service Card for more information

these MOBILIFT owners lift profits, lower costs



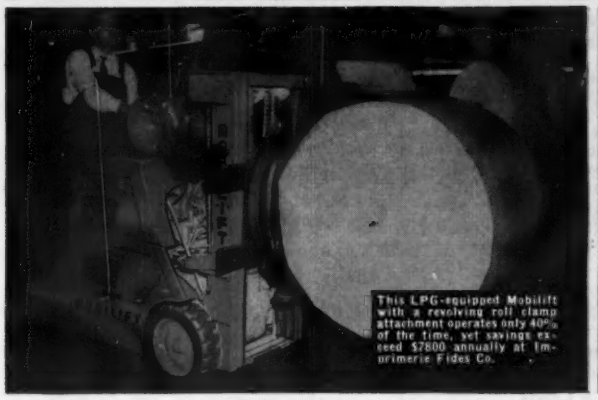
This Mobilift with LPG has lowered the cost of receiving, in-process handling, warehousing and shipping for the Chemical Corp.

One Mobilift handles all warehousing plus order selecting for over 200 stores served by Voss Grocery Co.



Three Mobilifts give Ralph B. Hunt & Co., Ltd., reduced personnel fatigue, cut overtime to near zero, and speed order deliveries . . . plus a tremendous annual cash saving.

This 2000 lb. capacity Mobilift—one of 5 at Tidewater-Cleveland Storage Corp.—easily pushes a 9000 lb. load to storage, saves four trips.



This LPG-equipped Mobilift with a revolving roll clamp attachment operates only 40% of the time, yet savings exceed $7800 annually at Imprimerie Fides Co.

Hubbard & Co. specified Mobilifts because they operate in less space . . . move more tonnage at lower cost in its plant and warehouse.

In company after company, industry after industry, Mobilift owners tell us they are the *only* industrial trucks which slash handling costs by:

1. Lowering operating costs
2. Cutting maintenance costs
3. Moving more tonnage per hour per dollar

Here are some of the reasons why: *Mobil-Matic* Drive* is the simplest, easiest-to-maintain automatic transmission on the market. *Finger-Tip Controls* provide a new standard of easy handling in the industrial truck field. *Hydra-Lizer** on "Sit-Downs", exclusive hydraulic equalizing rear suspension system automatically cross-compensates for floor variations up to 3". *Fluid Coupling* on "Sit-Downs", gives the smoothest, cushioned starts and stops of any truck. Mobilifts are available with factory-installed LPG equipment, and time-saving attachments for specialized operations. "Stand-Up" models up to 3500 lb. capacities; "Sit-Down" models up to 5000 lb. capacities.

Free! Valuable Information

- **How Mobilifts' exclusive features save dollars by increasing efficiency is described in this "Sit-Down" folder.**
- **This brochure describes the cost-saving features of the only "Stand-Up" line of gas-operated trucks on the market.**

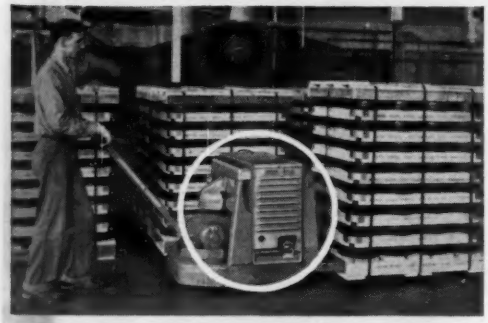
***Trade Mark**

LAMSON MOBILIFT® CORP 21 Lamson Street, Syracuse 1, New York

Mobilift Sales and Service is Available in 75 Cities Throughout the U. S. and Canada

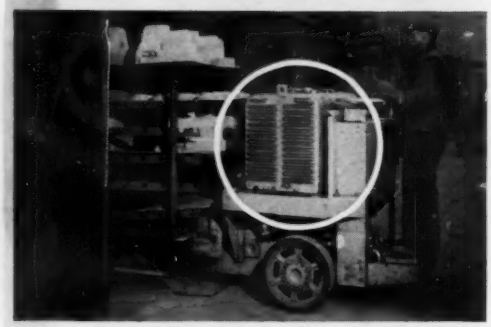
Circle No. 111 on Reader Service Card for more information

Get the Advantages of READY-POWER on Your Electric Industrial Trucks



Get Live Power for Walkie Trucks

Ready-Power's popular bantam model "W" is equipped with dependable 12-volt automotive-type starting and ignition. Variety of idling speeds and easy accessibility make it ideal for all walkie trucks as well as rider trucks up to 2,000 lbs.

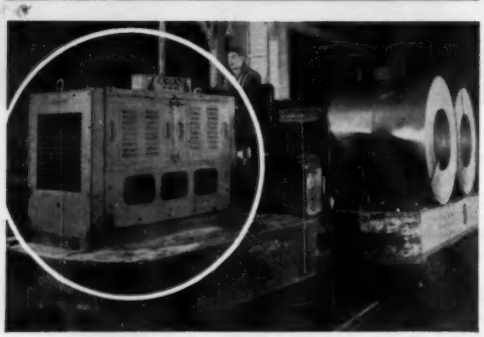


Work Your Fork, Platform, Tractor Trucks 'Round the Clock

Ready-Power gas-electric and LPG-electric units give materials handling trucks continuous, full power all the time. Slowdowns due to power fatigue are eliminated. The simple, all-electric control and live response make Ready-Power-equipped trucks rate high with truck operators.

Energize Lift Magnets on Your Electric Trucks

In the application shown at the left, the Ready-Power unit not only powers the truck, but also energizes the lift magnet for handling scrap metal. Ready-Power units are removable for shop adjustment while a spare keeps trucks working.



Get Diesel Electric for Lowest Ton-Mile Costs

Take a tip from the owners of industry's biggest trucks . . . power them with Ready-Power diesel-electric for maximum stamina, dependability, and lowest operating costs. Ready-Power offers power for every size and make of electric truck.

See Ready-Power on display, Booth 1409, The Material Handling Institute's Exposition, Cleveland, June 5-8.

READY-POWER

The READY-POWER Co., 3838 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Circle No. 162 on Reader Service Card for more information

HIGHLIGHTS of the MONTH'S NEWS

As We See This Year . . .

THE MOMENTUM of increasing mechanization will continue unabated through 1957. Research and development in all industries will be heavily concentrated on design of equipment, controls, and procedures to make each operation or process as automatic as possible.

We don't look for any tremendous peaks of accomplishment in the immedite future, but the possibility of some important disclosures cannot be ruled out. It is highly likely, for instance, that major advances toward the "automatic warehouse" will be made. Probably one or more of these will be in operation on a "production" basis within three years. At the other extreme, the pipe-line from West Virginia to Northeastern Ohio should very shortly be carrying coal in production quantities, and it shouldn't be too many months before the success of the system can be evaluated. Overland, intra- and interstate belt conveyors will come in for public attention again, and, one of these days, the way will be cleared to start construction.

In the Plant

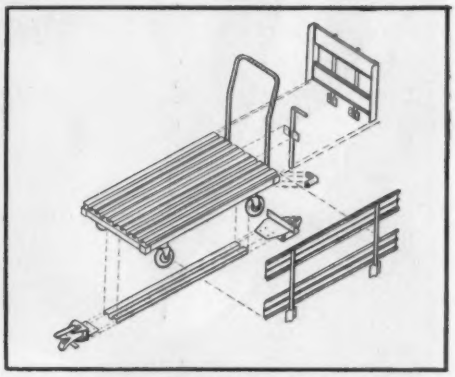
In the plant, we look for considerable progress in the development and application of systems and equipment for control of all production operations. By the end of the year, we expect to hear the word "feedback", or equivalent, much more frequently when latest production methods are discussed. More and more, the conversations and written words about material handling will include discussions of hydraulics, pneumatics, optics and electronics. Communications, audio and visual, will continue to be integrated into production and distribution processes.

In continuation of a trend al-

Maximum ease of starting-steering-stopping means that even a single Magcoa/Tobey platform truck will pay for itself in short order.

Dramatic reduction of operating and maintenance costs is the big reason why multi-truck users select Magcoa/Tobey platform trucks . . .

All-aluminum construction makes Magcoa/Tobey platform trucks attractive and clean . . . and easy to keep that way. They don't require painting; don't absorb water, grease or odors.



There's a Magcoa/Tobey aluminum platform truck for your individual needs. Hundreds of standard sizes and styles, with a wide range of accessories, wheel and tire types.

THEY'RE EASIER TO PUSH!

. . . that's why people are switching to Magcoa/Tobey aluminum trucks

Watch which truck your workers grab first when they have a choice —Magcoa/Tobey every time. The reason: Magcoa/Tobey trucks are easier to start, stop and maneuver—easier to operate.

Revolutionary casters — Exclusive Magcoa/Tobey swivel casters give you big, tapered roller bearings at opposite ends of a king-size spindle. You get the ultimate in starting, stopping and maneuvering ease . . . even under full load. These are *real* swivel casters . . . not a simple ball bearing sandwiched between two plates held together by a bolt.

Add to this the *light weight* of glistening, easy-to-keep-clean aluminum and you have some of the reasons why your workers choose Magcoa/Tobey—they're easier to push . . . easier to handle.

That cuts your truck cost to the bone. For the important truck cost is the *cost of moving the truck!* On the average, if you can save as little as 5% of truck operating cost through increased efficiency, you will save $200 per man, *per year*, every year!

Standard trucks for special jobs . . . another Magcoa/Tobey advantage. Magcoa/Tobey offers over 100 styles and sizes for every type job from handling food to handling greasy industrial products. Because of this wide variety, you can get specialized equipment for your specialized jobs . . . *at standard equipment prices.*

An illustrated data file tells the whole platform truck story. It also shows standard multi-deck trucks, baggage carts, accessories and other features which every truck user ought to know about. Use the coupon below for your free copy.

MAGNESIUM COMPANY OF AMERICA

TOBEY ALUMINUM DIVISION

East Chicago 1, Indiana

Representatives in Principal Cities

☐ Please send Magcoa/Tobey Data File

Name and title_____

Company_____

Address_____

City-Zone-State_____

Copyright, 1956, Magnesium Company of America

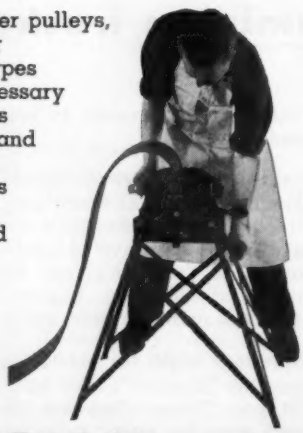
Circle No. 59 on Reader Service Card for more information

use
Clipper HOOKS and LACERS

High speeds, heavy loads, small-diameter pulleys, crowned rollers — these and many other conditions add up to hard wear for all types of belting, and weak spots cause unnecessary trouble. Make belt joints as durable as the belt itself. Use Clipper Hooks and Lacers. Clipper machine-lacing makes smooth, flexible, longer-lasting belt joints that save wear on expensive belts and machinery, slash costly maintenance and reduce unproductive downtime.

FOR MORE INFORMATION

Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.



Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

990 Front Ave., N. W. Grand Rapids 2, Michigan

Circle No. 98 on Reader Service Card for more information

ready well established, there will be more designs of special equipment and attachments for all kinds of industrial trucks. We expect to see a greater number of plants and operations where such attachments will be used with standardized containers and unitized loads.

Greater attention will be given to the maintenance of all types of equipment—and especially to material handling systems and devices which are so vital to the uninterrupted flow of materials through every plant and process.

It looks like another exciting year for those in material handling at operating levels. And it looks like a profitable year for managements which intend to incorporate more of the principles of sound handling into their company operations.

Like Love and Marriage . . .

THE FIRST FEMININE speaker to address a meeting of the Los Angeles AMHS Chapter told a large and appreciative audience that packaging and material handling are fully inter-related, cannot be considered separately.

Olive Salembier

Mrs. Olive Salembier, one of the few women packaging engineers in the country, spoke with the authority of a seldom-paralleled, dramatic success. Four years ago she founded Specification Packaging Engineering Corp., of which she is president. The business has grown from $500 a month to $1 million a year.

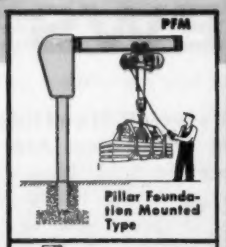
Packaging and material handling are like love and marriage, she concluded—you can't have one without the other, unless you expect to get into serious trouble.

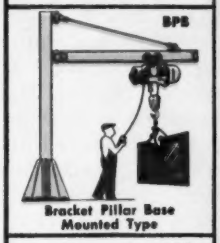
Ed Leighton

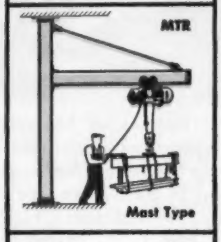
Editor

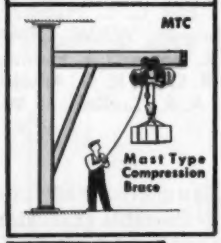
Industrial HEAVY DUTY JIB CRANES

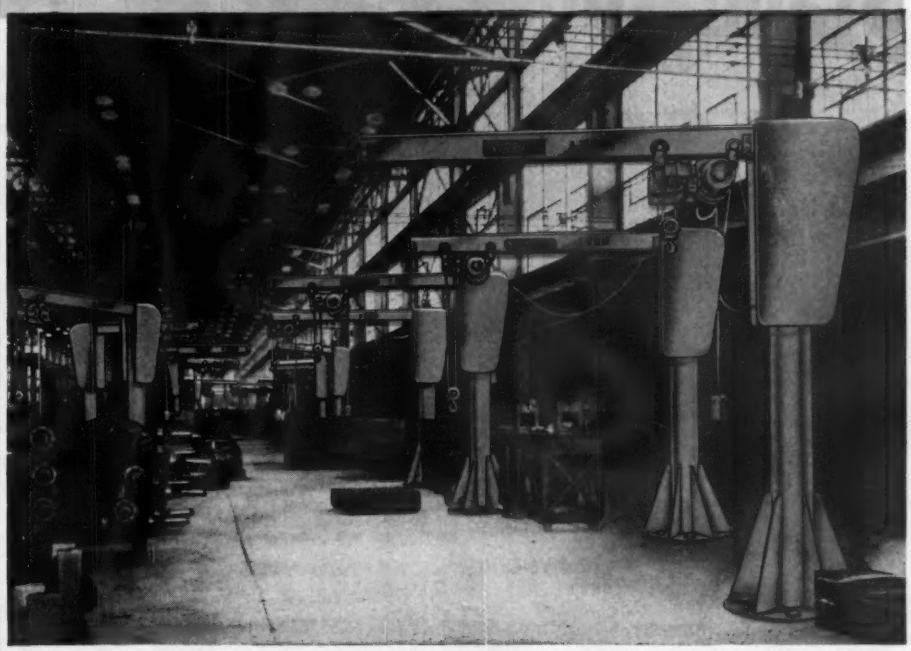
Precision Engineered and built for smooth efficient operation











PBM Pillar Base Mounted Type

The most "copied" PBM Jib Crane in Industry

Industrial PBM self-supported Jib Cranes are of all welded steel construction, rotate 360 degrees and have capacities up to 12,000 lbs. The rotating steel head revolves on 4 rollers and 9 precision ball bearings resulting in extremely smooth operation — unsurpassed by any other crane of its type. The high standard of workmanship and material, coupled with reliable performance make Industrial Jib Cranes your best buy.

Industrial manufactures 6 other types of Jibs and many models of Overhead Traveling Cranes to cover every need. Consult with Industrial for cranes to solve your material handling problems.

Industrial CRANES

INDUSTRIAL CRANE & HOIST

Ingersoll PRODUCTS DIVISION

BORG-WARNER CORPORATION

GENERAL OFFICES

1531 SOUTH PAULINA STREET CHICAGO 8, ILLINOIS

DISTRICT OFFICES: NEWARK • DETROIT • BIRMINGHAM

EXPORT SALES: BORG-WARNER INTERNATIONAL, 36 SOUTH WABASH AVE., CHICAGO, ILLINOIS

Circle No. 44 on Reader Service Card for more information

Ask Standard

how to cut costs with conveyors

Standard limit-switch-controlled Automatic Reciprocator is one of two used to form 200-ft. overhead detour of dehumidifier assembly line.

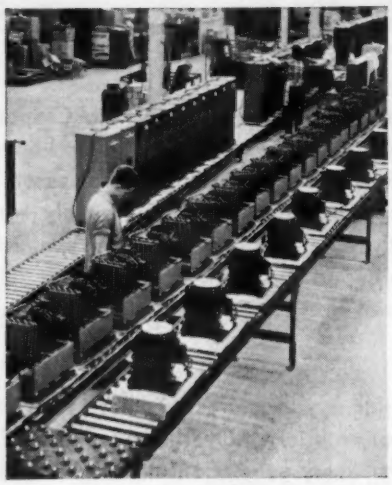
"COMPLETE CONVEYORIZING" ...what it did in a smaller plant

Products at Ebco stay on conveyors until packaged and sent to shipping.

Ebco Manufacturing Company — employing 275 people to produce water coolers, beverage dispensers and dehumidifiers — has realized substantial savings by completely conveyorizing their operations. Ebco engineers planned for an orderly conveyor system when developing plant layout and building design; consequently conveyor system costs were kept "low" and resulting efficiency is "excellent."

Similarly, it will pay you to take another close look at your present conveyor system. Standard specialists will be pleased to help you make evaluations . . . recommend the proper equipment and its application to meet your specific needs.

STANDARD CONVEYOR COMPANY, North St. Paul 9, Minnesota. Sales and Service in Principal Cities.



Gravity roller conveyors like this, used for Ebco's assembly lines, are inexpensive, easy to set up, and economical to maintain.

For details on Standard Conveyors of all types, contact the Standard representative listed in your classified phone book or write direct. Ask for Bulletin A-1.

Circle No. 83 on Reader Service Card for more information

ASSOCIATION and SOCIETY NEWS

• **The Material Handling Equipment Distributors Association** recently held its Mid-Year Meeting of the Board of Directors, in San Francisco, California. The board decided to hold its 1957 convention meeting on April 26 and 27, at the Chalfonte-Hadden Hall Hotel, Atlantic City, New Jersey. They also approved the association's group insurance plan, as well as plans for a catalog which will be started shortly. Committee was established to promote a closer working relationship with other organizations in the material handling field.

Board of Directors of Material Handling Equipment Distributors Association, attending the mid-year meeting in San Francisco. (left to right) S. B. McDonald, H. E. Little, C. H. Ellis, C. C. Haddrell, H. W. Embry Jr., W. W. Oliver (pres.), W. R. Noble, J. P. Hamerslag Jr., G. R. Case, R. G. Arnold, A. H. Bode, A. R. Canfield, H. W. Wiese.

• **The Association of Lift Truck and Portable Elevator Manufacturers** held its Annual Meeting on December 11, in New York City. At this meeting, the association voted to hold its Spring Meeting for 1957 on April 16 in Chicago, at the Edgewater Beach Hotel.

• **The Powell Pressed Steel Company,** Hubbard, Ohio has joined The Material Handling Institute, Inc. As a manufac-

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BETTER STACKING

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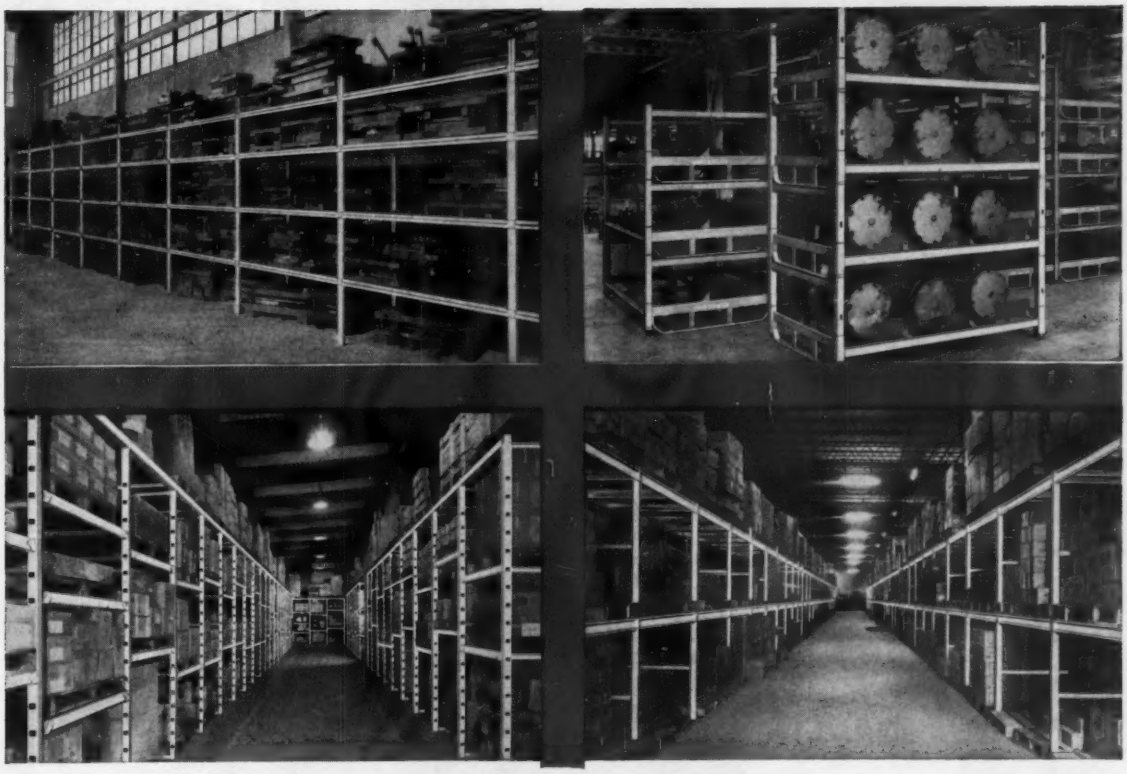
STORAGE

Industry is buying more American Racks than ever before, because no other stationary or portable racks can match American Rack features. For cutting installation and materials handling costs, you can't beat American. May we send you our catalog?



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ASSOCIATIONS

Continued

turer of steel skids, pallets, special skid boxes, dump boxes and the Flow-Matic handling system, the company will be active in both the Pallets & Auxiliary Equipment and the Industrial Metal Container product sections of the institute. H. L. Powell, vice president, will be the firm's official representative to the MHI. This brings membership in MHI to 74, with 64 manufacturing members and 10 associate members.

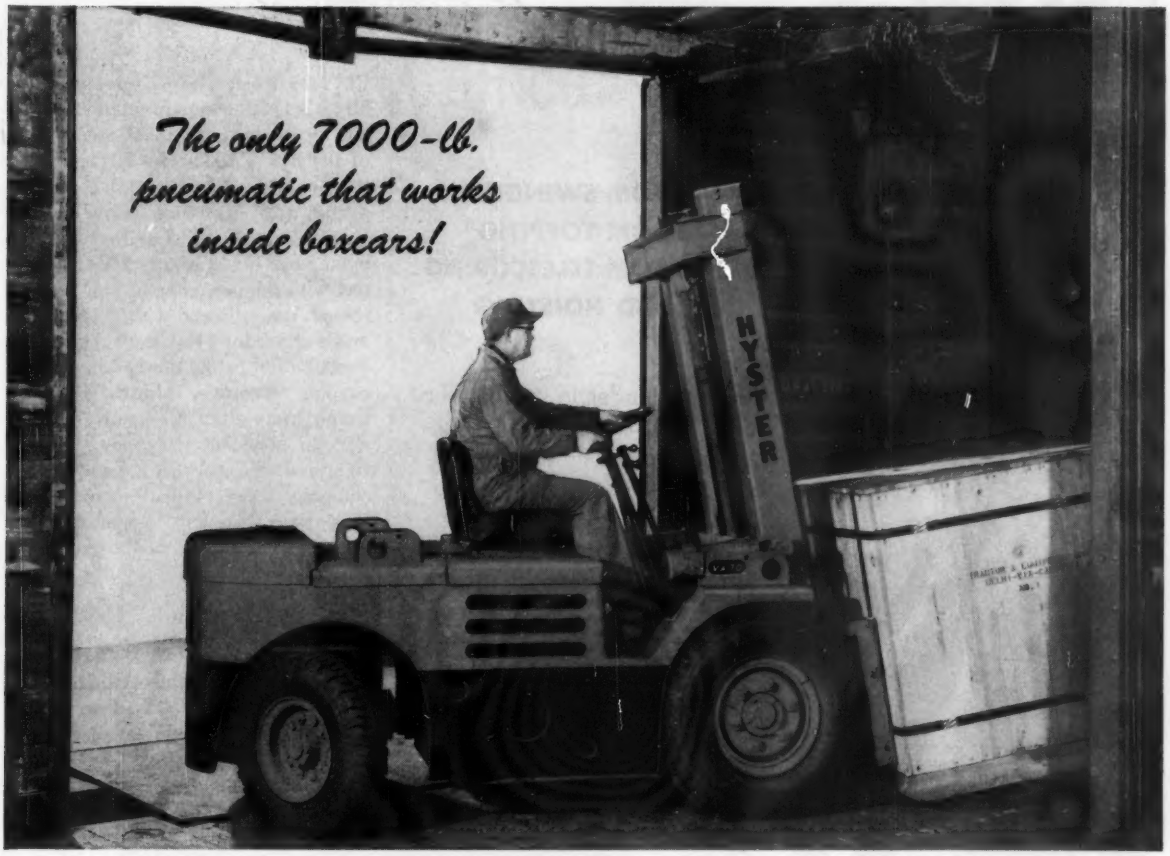
• **The National Wooden Box Association** is preparing for its 58th annual meeting, which will be held at the Boca Raton Hotel and Club, Boca Raton, Florida on January 31 and February 1, 1957.

• **Harry S. Adler** was presented with a commemorative plaque in honor of his long service to the Fibre Box Industry at the 1956 annual meeting of the Fibre Box Association held recently in New York. Shown here, Adler (right) is presented with the plaque by Harold M. Treen, a director of the association. Adler has been associated with the industry since 1921, and was secretary and assistant executive manager of the association until his retirement on December 31.

• **At the last meeting of the American Material Handling Society's National Standards Committee, Joseph T. Heffernan** of the Ford Motor Company, Dearborn, Mich., was elected new co-chairman of the committee. Heffernan replaces Prof. Donald L. Perkins of Wayne University, who resigned the office because of the press of regular duties.

NEW! A 7000-LB. PNEUMATIC DESIGNED ESPECIALLY FOR CLOSE-QUARTER OPERATION

(POWER STEERING STANDARD)



PERMITS NARROWER STACKING AISLES, LEAVES MORE SPACE FOR STORAGE

The Hyster 70 has shortest turning radius, narrowest and shortest overall dimensions of any 7000-lb. pneumatic! Indoors and outdoors, you can now have narrower stacking aisles—thus utilizing more space for storage.

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Originator and leader in its class for 30 years, ***KRANE KAR*** goes ALL-HYDRAULIC. Affords amazing ease of handling . . . touch control of all crane operations . . . with other engineering advances that simplify operator's work . . . eliminating gear shifting and clutch replacements . . . cutting maintenance to the bone and setting new standards of efficiency and productivity. Get the details.

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MHS NEWS FROM THE CHAPTERS

PITTSBURGH, PA.—Representatives of 20 companies attended the recent organizational meeting of the new Pittsburgh Chapter of the **Society of Industrial Packaging and Material Handling Engineers. C. J. Carney, Jr.,** managing director of SIPMHE, met with the new chapter and presented the officers with a gavel and a check for $100, the Society's contribution to the newly founded chapter. **Francis Aland,** Pittsburgh Plate Glass Company, was elected president pro tem, and **Richard Majesky,** of the same company, was elected secretary-treasurer pro tem. Regular officers will be elected at the end of six months.

INDIANAPOLIS, IND.—The Indianapolis Chapter of the **American Material Handling Society** recently had a program devoted to the proper use of containers, at which discussions were held on uses and abuses of tote boxes and other units. The AMHS group met at Athenaeum Turners, Indianapolis. Speakers at the meeting were **Harry Metzel,** Metco Material Handling, Inc.; **Robert Hiatt,** Lyon Metal Products; and **Wally Schermer,** Union Steel Products Co.

PHILADELPHIA, PA.—"How Plywood Is Used in Packaging" was the subject of a recent meeting of the Philadelphia Regional Division of the **Society of Industrial Packaging and Material Engineers.** The meeting was held at the M. L. A. Club in Philadelphia. **Donald Muller** and **Allen Jordon,** of Atlas Plywood Corp.,

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Avoiding bottlenecks with road-to-track flexibility is just one of the many features of the Trackmobile that provides faster, lower cost freight car handling. It quickly hauls, switches and spots . . . clogged sidings and heavy traffic present no problems. It's a safe, proven method of moving cars . . . firms throughout industry are using one or more in their yards. Discover the many Trackmobile benefits . . . see Whiting's new color slide film, "The Economies of Freight Car Moving" in your office. It tells a complete story but requires only a few minutes of your time. Write or phone us today and a showing will be arranged at your convenience!

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can do more jobs
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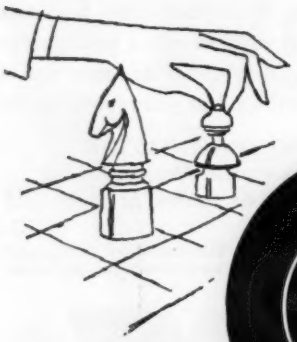

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Now, available L.P.G.- diesel- or
gasoline-electric powered in capacities
from 2 to 15 tons. Available on
long term lease arrangement, too.

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CHAPTER NEWS

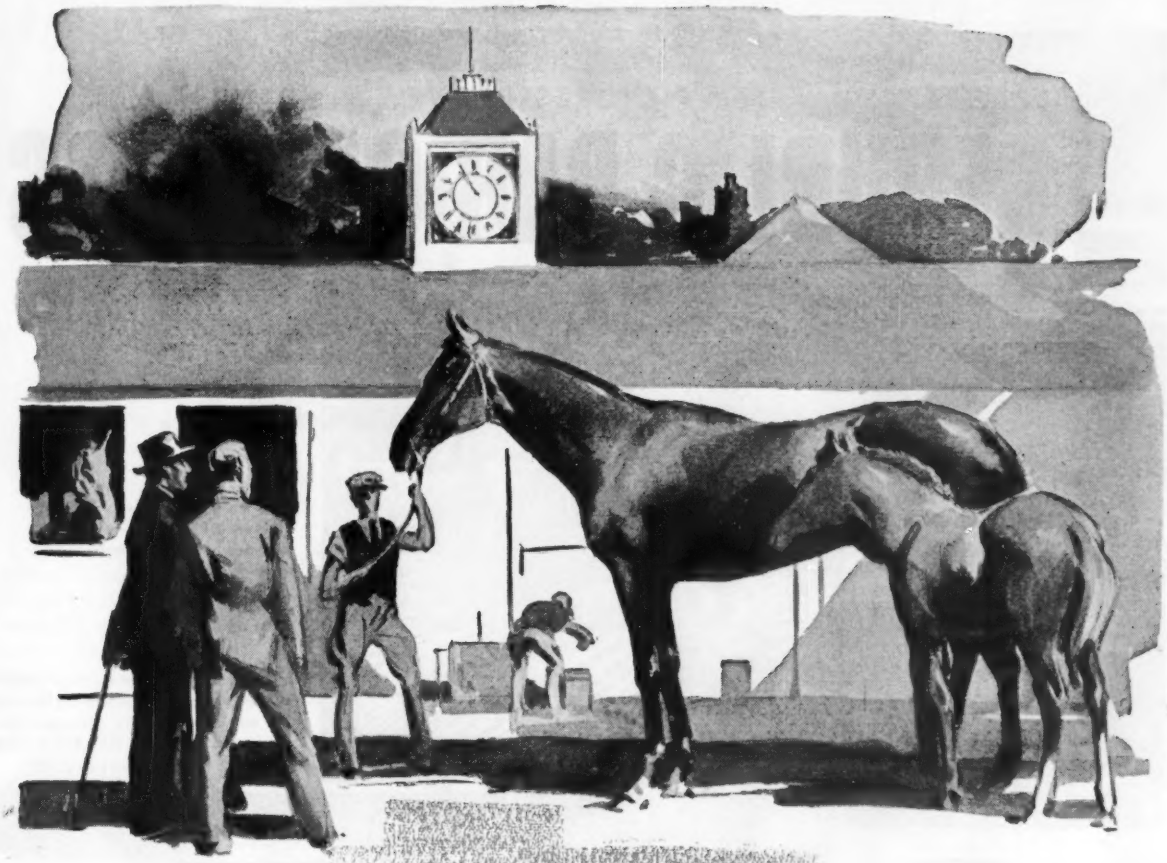
Continued

spoke to the SIPMHE group on the manufacture and civilian and military applications of plywood.

ATLANTA, GA.—The 5th Annual Short Course in Material Handling sponsored by the Region VIII of the **American Material Handling Society,** will be held at Georgia Institute of Technology January 31 through February 2. Under the auspices of the Georgia Tech Extension Division, the Short Course will be conducted at the A. French Building, and will include staff members of the Georgia Tech faculty as well as the following nationally known speakers. **James R. Bright,** Graduate School of Business, Harvard University; **Irving M. Footlik,** I. M. Footlik Associates; **Frank Wier,** Timken Roller Bearing Company; **Norman D. Shikes,** Radio Corporation of America; **J. W. Hall,** Westinghouse Electric Corporation.

LOS ANGELES, CALIF.—The California Division of the **Socioty of Industrial Packaging and Material Handling Engineers** was taken on a tour on December 3, of Anheuser-Busch Inc., Los Angeles Brewery. The group surveyed the Van Nuys Plant of the brewery.

MONTREAL, P. Q.—The Montreal Chapter of the **American Material Handling Society** has announced plans to sponsor the first Canadian National Material Handling Show and Conference to be held in Montreal, September 30 through October 4, 1957. The show will include European firms and personnel, as well as those of native North America, according to **Sydney Kom,** president of the AMHS group. **Emile Dupre,** chairman of the Exposition Advisory Committee of AMHS, has been selected as head of the planning and organizing committee for the show.



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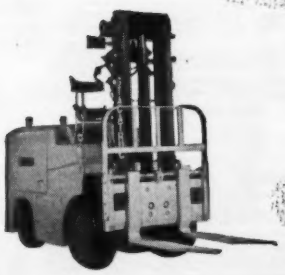
know a good thing when they see it! With horses or horsepower, breeding and performance remain prime factors in the establishment of a sound reputation. It is through these qualities that Stacatruc fork lift trucks have come to be universally regarded as thoroughbreds in the field of materials handling.



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BEFORE AND AFTER PICTURES PROVE...

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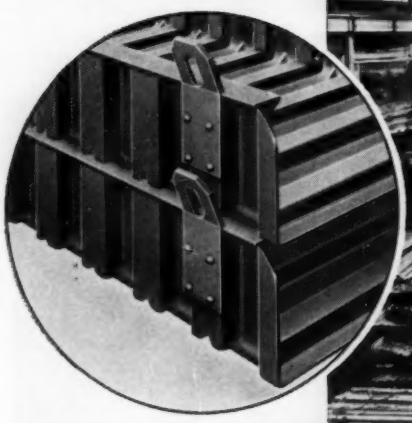
BEFORE Republic Bar Carriers, materials were piled wherever space allowed. Handling operations were impeded. Inventory control was practically impossible.

AFTER Republic Bar Carriers were installed, materials could be handled quickly and easily. Valuable floor space was saved. Materials became easily accessible.



CARRIERS are equipped with crane-handling lugs which also permit stacking. Corrugated steel construction provides strength, assures long service life at lowest per-year-cost.

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save space, speed handling, make materials easily accessible

SAVE SPACE with Republic Steel Pallet Racks. They provide a practical, economical way to palletize and stack bulky, uneven, fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Send coupon for complete description, specifications and quotations.

Before Republic P-135 Bar Carriers went to work in this plant of a nationally known manufacturer*, materials of varying sizes and types were piled up just as they were received on shipment. To move a specific item to the production area required many handling operations. It was both costly and time-consuming.

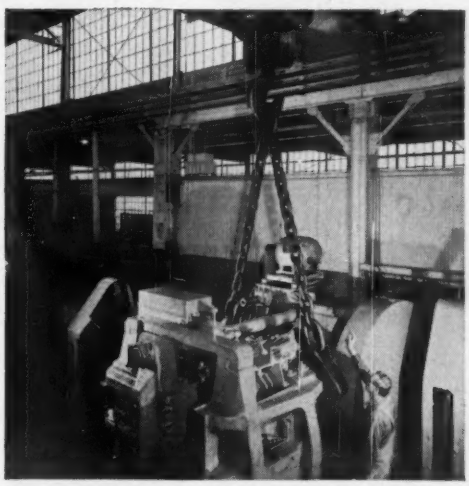
Then the company purchased and put to work a battery of Republic Bar Carriers. These units are ideally suited to handling groups of various size materials with lengths longer than the carrier.

Note in the "after" photo how materials are efficiently separated according to size and type. There's no inventory problem here now. Note, too, how tiering of the carriers saves space. Open-end construction permits easy accessibility to items at any spot in the tier—whether at top or bottom.

These units can also be used to advantage in handling pipe, tubing, angle irons, reinforcing rods, mouldings, extrusions, narrow-width sheets and plates, and many other materials characterized by narrow dimensions. Length, width and height of Republic Carriers can be designed to meet your specific requirements.

The Republic P-135 Bar Carrier may be the solution to your handling problem. Or you may require the design of a completely new unit. Our engineers will help you without obligation. Contact your Republic Materials Handling Representative for more information. Or mail the attached coupon.

**Name on request.*



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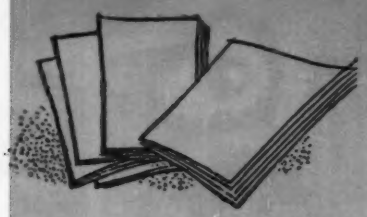

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Carton-Closing Stapler . . . operated with one hand has a unique lever action plus an effective spring-loaded lever return which makes staple driving effortless and positive. The magazine will accommodate ½", ⅝" and ¾" staples. Illustrated literature is available from International Staple & Machine Co.

Circle 46 on Reader Service Card

Two-Way Radio Communications . . . for use on tractors, trucks, and all types of vehicles in the material handling field is discussed in literature offered by Pye Corp. of America. This unit offers such features as highly efficient noise limiting, easy alignment, minimum battery drain and mounts easily under dash board without special tools.

Circle 96 on Reader Service Card

Hydraulic Fork Control . . . for 3000 to 20,000 pound trucks is discussed in data available from Swing-Shift Mfg. Co. These units allow both forks of the truck to swing and shift loads quickly into exact alignment without moving truck from original approach. It is said to speed carloading up to 28% and reduce damage.

Circle 86 on Reader Service Card

Portable Bag Closer . . . handles all varieties of bags and weighs only 10½ pounds. Plugs into any outlet—closes average 100 pound bag in less than 6 seconds—can be suspended for stationary use and is simple to operate and maintain. Literature is offered you by Dave Fischbein Co.

Circle 147 on Reader Service Card

Walkie-Type Truck . . . a booklet giving construction details, features and reasons why a Powrworker will profit your operations is offered you by Clark Equipment Co., Industrial Truck Div.

Circle 22 on Reader Service Card

Magnesium Dock Boards . . . which are designed to meet all types of loading conditions, eliminate costly delays and reduce loading costs are fully described in a bulletin available from Magline Inc.

Circle 57 on Reader Service Card

Power Conveyors . . . which simplify, eliminate or combine many operations, reduce manual handling, eliminate conjested areas and reduce worker fatigue are described in data offered you by Harry J. Ferguson Co.

Circle 32 on Reader Service Card

Platform Truck . . . offers such features as two drive wheels instead of one—two braking systems instead of one—four wheel stability instead of three—alloy gear transmission instead of chains, etc. A catalog giving full particulars is available from Lift Trucks, Inc.

Circle 56 on Reader Service Card

Storage Racks . . . the Storage Rack Div., American Metal Products Co. are offering their latest catalog in which they give details on their standard and adjustable pallet racks, skid racks, tool and die racks, racks for drums and barrels, etc. It's yours for the asking.

Circle 143 on Reader Service Card

How to Cut Costs . . . with conveyors is discussed in a bulletin offered you by Standard Conveyor Co. It gives details on Standard conveyors of all types.

Circle 83 on Reader Service Card

Rider- and Walkie-Type Trucks . . . are the subject of two catalogs offered you by The Moto-Truc Co. Full details on both types are given.

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Dumper . . . lifts, upends and dumps 100 loads per hour with a lifting capacity range from 100 to 1500 pounds. May be used for lifting and dumping bags, bulk, barrels, and boxes. A complete catalog is offered you by Colson Equipment & Supply Co.

Circle 16 on Reader Service Card

Doubles as Car Switcher . . . A new use has been found for the Michigan Tractor Shovels heretofore used for handling sand, rock and other bulk materials, stockpiling coal, loading lumber and doing yard work. One user has put his tractor shovel to work switching railroad cars, moving empties, etc. Details are available from the Clark Equipment Co., Construction Machinery Div.

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Wire Rope Slings and Assemblies . . . a new 52-page book, with drawings and photographs, contains concise, easy-to-find and easy-to-use information on slings, fittings and assemblies and is offered you by John A. Roebling's Sons Corp.

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Lift Truck Attachments . . . enable you to handle steel drums, crates, boxes, bales, etc. With these Little Giant Gripper Arms, any lift truck can handle almost any type of load instead of each lift truck handling only each type of load. Full information is available from Little Giant Products, Inc.

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Crane Accessories . . . grabs and other lifting attachments for handling sheet steel, angles, barrels, etc. are fully described in a catalog by Merrill Brothers.

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Dockboard Locking Device . . . the Span-Lock provides positive protection against dockboard slippage—protection against personnel injuries and costly damage to loads and equipment. Adjustable to a fraction of an inch. Holds dockboards in the exact position desired—dock-to-truck, dock-to-car or car-to-car. Details are available in a bulletin published by Magnesium Co. of America.

Circle 58 on Reader Service Card

Cost-Cutter Conveyors . . . available in 22 models. Aluminum or steel—electric or gas—lengths from 4′ to 40′ and belt widths from 8″ to 24″. A bulletin describing these conveyors is available from New London Engineering Co.

Circle 69 on Reader Service Card

Heavy Duty Jib Cranes . . . made of all welded steel construction—rotate 360° and have capacities up to 12000 pounds. The steel head rotates on four rollers and nine precision ball bearings resulting in extremely smooth operation. A catalog is offered you by Industrial Crane & Hoist Corp.

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Adjustable Dock . . . utilizes two hydraulic jacks to raise or lower trailer or truck to dock level. Installation is made in pavement in front of loading dock, leaving dock platform completely free of obstructions. A catalog on the Rotary Truck Leveler is offered by Rotary Lift Co.

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for handling wet or dry, ho
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handling. Fit any standard fo
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mounted on live skids—ca
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Automatic Truck Ramp
which supports 20,000 p
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which features a simple, preci
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ors . . . provide cushio
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standard fork or
k. Also available
ve skids—casters
or rubber tired
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details are avail-
Iron Works, Inc.
der Service Card

Handling . . . is
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new color slide
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der Service Card

ruck Ramp . . .
s 20,000 pound
utomatically and
simple, precision
mechanism is
a available from
Co.

der Service Card

ers for Convey-
de cushioned,
—suitable for fin-
glass, plexiglass,
used for die lift-
welders, gravity
tc. Five models
are offered you
Inc.

der Service Card

Use This

READER SERVICE CARD

to obtain information on any item in this issue

New Equipment & Supplies ..... Starting on Page 157
Useful Literature ..... Starting on Page 135

PLEASE PRINT — JANUARY 1957. Do not use after 4-15-57

Name ..... Position .....

Company ..... Kind of Business .....

Street .....

City ..... Zone..... State.....

PLEASE SEND ME ADDITIONAL INFORMATION AND LITERATURE ON ITEMS CIRCLED BELOW.

1	26	51	76	101	126	151	176	201	226	251	276	301	326	351	376	401	426	451	476
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FIRST CLASS
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CLEVELAND, OHIO

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FLOW

812 HURON RD. • CLEVELAND 15, OHIO

CATALOGS AND BULLETINS

Continued

Towing Tractors . . . in various models which have drawbar pulls of from 2400 to 12,000 pounds are described in literature available from Allis-Chalmers Mfg. Co., Buda Div. Some models require less than a ten foot turning radius. Available in either gasoline or diesel models.

Circle 101 on Reader Service Card

Magnesium . . . as a material for extrusions, material handling equipment, etc. is the subject of data available from The Dow Chemical Co. The company also offers complete facilities for design, engineering and production of magnesium extrusions.

Circle 154 on Reader Service Card

A Low-Cost Tool . . . for moving heavy objects is the Micro Lever Dolly. The size and position of the wheels permit the lift blade to pry under objects flat on the floor. Four sizes, with a choice of metal or rubber wheels is available and are described in literature available from Micron, Inc.

Circle 112 on Reader Service Card

Conveyor Pulleys . . . in any size and shape are discussed in data offered you by Mercury Industries, Inc. These pulleys are constructed of seamless solid steel. Guaranteed longer belt life. Both crown and straight faces are available.

Circle 155 on Reader Service Card

How to Double Your Warehouse Capacity . . . is the title of a booklet offered you by The Frick-Gallagher Mfg. Co., Inc. The company's complete line of racks, bins, shelving and frames is discussed.

Circle 33 on Reader Service Card

Conveyor Belting . . . Omni-Lex belting is discussed in a catalog available from Ashworth Bros., Inc. Some of the advantages listed are short turning radius, light weight, and easy installation and maintenance. Permits production flow to ride around corners.

Circle 6 on Reader Service Card

Industrial Trucks . . . the Multi-Lift is said to be the answer to doors, passageways or other confining areas that makes it difficult to use a fork lift truck. Improved operator visibility and simple operation are some of the features. Further information may be had from Truck-Man Div., The Knickerbocker Co.

Circle 141 on Reader Service Card

How 35 Manufacturers Saved . . . with USS Cyclone Processing Belts is the title of a belt booklet on production line savings offered you by Cyclone Fence Dept., American Steel & Wire Div., U. S. Steel Corp. Included are many examples of cost-cutting, one of which could most likely be applied to your own operation.

Circle 153 on Reader Service Card

Hoist with Extra Stamina . . . built in to each component, including precision cut alloy steel spur gears, wide faced and heat-treated, mounted on alloy steel shafts running in sealed ball bearings, all splash lubricated. Capacities from 1000 to 20,000 pounds, with speeds from ten to fifty-four fpm, and standard lifts from sixteen to forty feet. Detailed in hoist Bulletin F offered by Robbins & Myers, Inc.

Circle 77 on Reader Service Card

101 Cost-Cutting Ways . . . is the title of a booklet Coles Cranes, Inc. is offering which gives details on their cranes available in LP-Gas, diesel or gasoline-electric powered models. Capacities range from 2 to 15 tons. These units are also available on long term lease arrangement.

Circle 15 on Reader Service Card

High Vacuum Pumps . . . by Tokheim are said to eliminate dangerous handling of industrial liquids. Help prevent spilling, slopping, over-filling and dripping. Available with hose or spout outlets and other attachments. Pump operates on both forward and back strokes—delivers 20 gallons a minute. Further information is available from Tokheim Corp.

Circle 142 on Reader Service Card

Collapsible Pallet Boxes . . . made in three models—plain, open front and drop leaf—a complete line for all types of material handling. Among other advantages listed are ease of stacking, they collapse for storing—handle up to 5000 pounds and are claimed to reduce labor and handling cost. Complete details and prices are available from Bigelow-Garvey Lumber Co.

Circle 92 on Reader Service Card

A Gallon of Oysters . . . is what you'll get if you don't agree with The Cambridge Wire Cloth Co. that their gripper woven wire slings are easier, faster and safer to use. It's no joke, either. Details on their slings and information on the offer are available from the company.

Circle 12 on Reader Service Card

FOR CONVEYOR DRIVES—NOTHING BEATS DIAMOND ROLLER CHAIN!

POSITIVE • • •

LIGHT WEIGHT • • •

LONG LIFE • • •

FLEXIBLE • • •

● On this model of a Cherry-Burrell Case Conveyor, the power drive is located some distance *above* the conveyor shaft. On others the drives may be shorter or located below the shaft. In any case the Diamond Roller Chain assures non-slipping power transfer in the most practical and economical manner.

Gears would require more bulk and weight, with costly shafts and bearings.

Belts for this kind of application cannot provide the accuracy of conveyor movement and timing.

Diamond Roller Chains are highly flexible in application. Their *light weight* in relation to power transferred helps improve machinery design. The *efficiency* of Diamond Roller Chains cannot be matched by any other method of power transmission.

Diamond Application Engineers have sixty-seven years of experience to draw from in making recommendations. This experience is available to help solve your drive problems. No obligation of course.

DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Traditional

Dept. 624, 402 Kentucky Ave., Indianapolis 7, Indiana

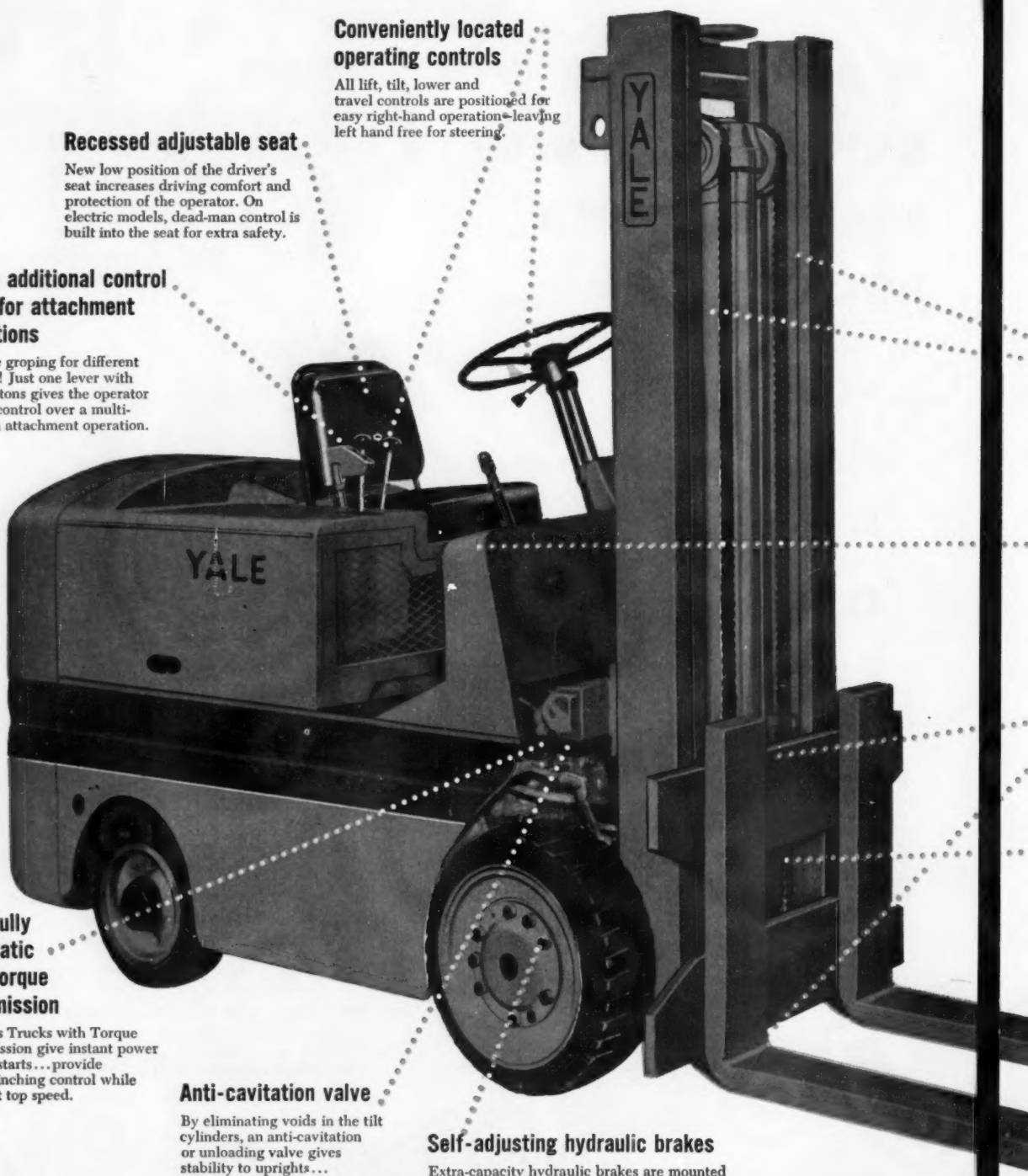
Offices and Distributors in All Principal Cities

Please refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS

Circle No. 136 on Reader Service Card for more information

IO PREMIUM



Conveniently located operating controls

All lift, tilt, lower and travel controls are positioned for easy right-hand operation—leaving left hand free for steering.

Recessed adjustable seat

New low position of the driver's seat increases driving comfort and protection of the operator. On electric models, dead-man control is built into the seat for extra safety.

Single additional control lever for attachment operations

No more groping for different controls! Just one lever with pushbuttons gives the operator instant control over a multi-function attachment operation.

New fully automatic Yale torque transmission

Yale Gas Trucks with Torque Transmission give instant power for fast starts... provide perfect inching control while lifting at top speed.

Anti-cavitation valve

By eliminating voids in the tilt cylinders, an anti-cavitation or unloading valve gives stability to uprights... eliminates channel sway.

Self-adjusting hydraulic brakes

Extra-capacity hydraulic brakes are mounted directly to each drive wheel for easier, faster stopping without jolting or load damage.

ADVANCEMENTS:

ONLY YALE OFFERS ALL 10 AS STANDARD FEATURES IN A COMPLETE FORK TRUCK LINE

Improved roller channel construction

Special rolled channels have thick flange sections for extra long life. Hose take-ups for attachments are located *within* the channels to prevent hose damage and increase forward visibility.

Lowered cowl

The new low cowl gives the operator more visibility, yet provides him with adequate protection. All instruments are water-proofed, recessed in the cowl and grouped for easy reading.

Four side-thrust rollers

Two side-thrust rollers on either side of the carriage reduce stress and compensate for off-center loading.

Flow regulator valve

This valve assures smooth lowering control without excessive speed.

Now—all the "de luxe" Yale truck power and operating improvements of recent years built in as standard features! This is

Yale "Integrated Design"

—the bold new concept in fork truck engineering that offers every industry today's highest level of truck performance.

Extensive Yale research and field testing proved—truck performance over the long haul can't be of top efficiency unless the truck is *engineered* for it! The result: Yale "Integrated Design"—the incorporation of premium advances as standard features built into a complete line of trucks that meet all the day-in, day-out demands for power, efficiency, safety, versatility and operator comfort—even under the toughest handling conditions.

This new concept means more economical materials handling—in initial truck investment, in operating costs, in maintenance costs. You get the greatest possible truck value for your materials handling dollar. To extend this value even further, Yale "Integrated Design" Trucks have a high degree of interchangeability of parts. Thus, whether you operate a fleet of gasoline trucks, or gasoline and electric trucks of comparable capacities, you need only a limited spare-part inventory.

To meet the great variety of handling needs of every industry, Yale "Integrated Design" offers you a complete line of fork lift trucks: Gas Trucks in capacities of 2,000 to 10,000 lbs. with Yale Torque Transmission, Fluid Coupling or Standard Transmission; Electric Trucks, equipped with Yale's exclusive Magnetic Cam-O-Tactor Controller, in capacities up to 150,000 lbs. For full facts and specifications, write The Yale & Towne Manufacturing Co., Philadelphia 15, Pa., Dept. 41.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*REG. U. S. PAT. OFF

Gas, Electric & LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Hand and Electric Hoists

Circle No. 151 on Reader Service Card for more information

CATALOGS

Continued

Conveyor Roller Chain . . . which assures positive drive, is light weight and flexible is described in data available from Diamond Chain Co., Inc. These chains are said to provide non-slipping power transfer in the most practical and economical manner.

Circle 136 on Reader Service Card

Weight Indicator . . . which is said to assure more profit and less work in scrap salvage is described in an illustrated catalog published by W. C. Dillon & Co., Inc. They will adjust for tare—attach to any hoisting crane for on-the-move readings and are available with capacities to 5000 pounds.

Circle 133 on Reader Service Card

Wheelbarrows . . . with choice of pneumatic, semi-pneumatic or steel-tired wheels (with plain, ball or roller bearings) are said to be the easiest rolling wheelbarrows made. They are engineered to balance 4/5ths of the load on the wheel and 1/5th of the load at the handle grips. Full details are offered you by Sterling Wheelbarrow Co.

Circle 84 on Reader Service Card

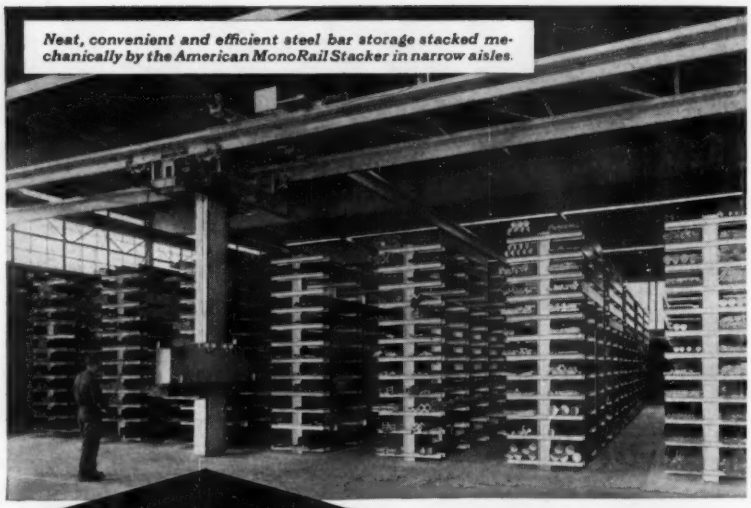
Magnesium Ramp . . . features slanting safety "side-rails" which protect ramp, equipment, tires and workers—prevent run-off. Also has safety "curb ends" which give double strength at shock points. Constructed of all welded, lightweight magnesium. Positive locking device holds ramp in position. Further information is available from Penco Engineering Co.

Circle 71 on Reader Service Card

Dock Covers . . . which give protection against cold and loss of heat between cars and building doorways in unloading operations are described in literature available from CAPCO.

Circle 13 on Reader Service Card

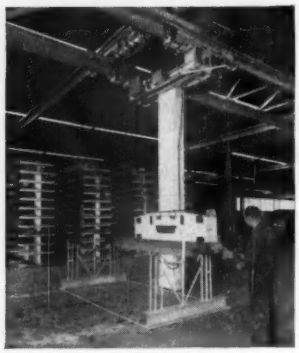
Neat, convenient and efficient steel bar storage stacked mechanically by the American MonoRail Stacker in narrow aisles.



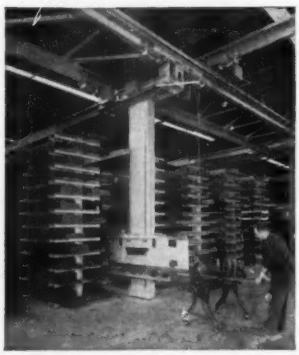
HOW'S THIS FOR STEEL STORAGE!

American MonoRail engineers, working with Hawkridge Brothers Company, designed this system for storing bars, rods and other long steel shapes.

Note the extremely narrow aisles and maximum height of racks. Bars and rods, 20-22 feet long, are placed in pans 18 feet long. The American MonoRail Stacker transfers these pans to either side of an aisle for storage.



American MonoRail Stacker lowers a banded bundle of bars over prongs which ingeniously splits bands, lets bars roll into trough for pick-up in a tray



MonoRail Stacker forks support bar in saw. Saw with extension rolls to any convenient spot in the warehouse.

Photos: Courtesy of Hawkridge Brothers Company, Waterbury, Conn.

Member of Materials Handling Institute - MonoRail Association

AMERICAN MONORAIL COMPANY

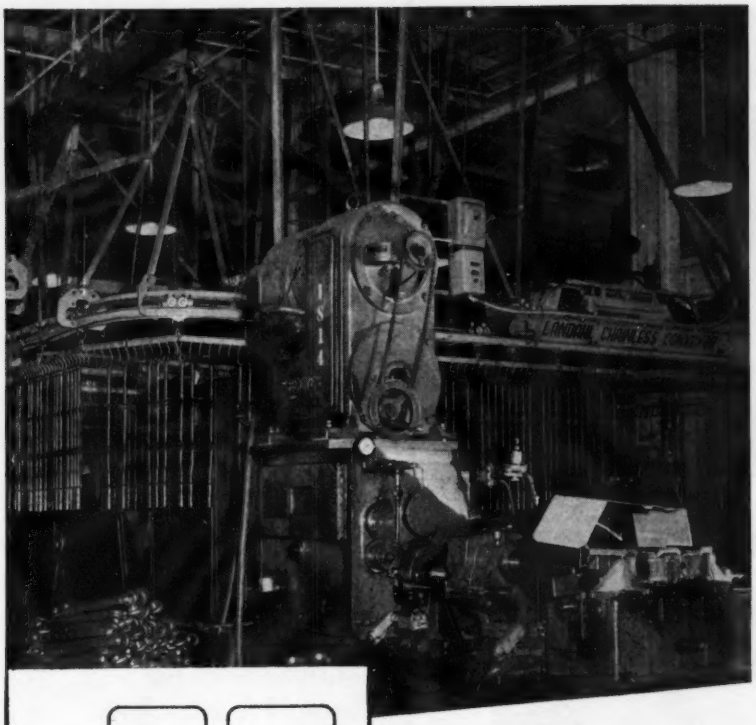
OVERHEAD HANDLING EQUIPMENT

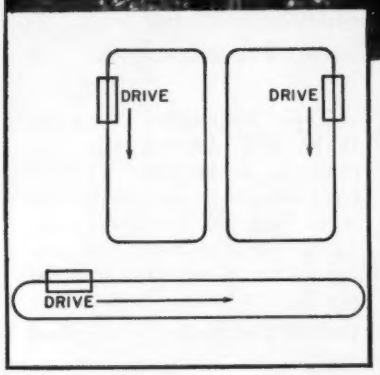
13129 ATHENS AVENUE • CLEVELAND 7, OHIO

(IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

AUTOMATIC DISPATCHER | STACKER CRANE | RETRACTABLE CRANE | MANUAL MONORAIL

Circle No. 4 on Reader Service Card for more information





LANDAHL

Keeps Auto Tie-Rods Moving

From the semi-finished stage through degreasing and cleaning on through machine operations, Landahl Chainless Conveyors move automobile tie-rods continuously. With this versatile system the rods can be stopped and started should a need arise in this huge plant in Detroit.

And the conveyor is utilizing "waste space" overhead doing its work at top efficiency.

Reasons for Landahl Conveyor low cost operation are: short radius turns, open type construction, no cable to sag, no sprockets to wear.

If you have a conveying problem, write us today. Ask for Bulletin LS-1.

The LANDAHL CONVEYOR CO., 13129 Athens Ave., Cleveland 7, Ohio

A SUBSIDIARY OF THE AMERICAN MONORAIL COMPANY

Circle No. 51 on Reader Service Card for more information

Hand Stamp Stencil Duplicator . . . prints shipping data direct on cartons, boxes, packages, etc. and eliminates double operation of preparing labels and then pasting them on the containers. Handy as a rubber stamp —fully portable and gives 1000 or more clear, sharp impressions from one typewritten stencil without re-inking. Information is available from Multistamp Co.

Circle 67 on Reader Service Card

Expanded Metal Stacking Basket . . . eliminates parts transfer and is ideal for degreasing, dipping, plating, cleaning, parts storage and all general small parts handling. Prices and specifications are offered you by Randolph Industrial Equipment Co.

Circle 75 on Reader Service Card

Industrial Casters . . . a new engineering manual on casters and wheels is yours for the asking from Saginaw Products Corp.

Circle 80 on Reader Service Card

Tape Dispensers and Moisteners . . . are the subject of a booklet, "How to Adapt Your Shipping Department for Two-Strip Sealing" being offered by Seal-O-Matic Dispenser Corp. The machines are unconditionally guaranteed for two years.

Circle 97 on Reader Service Card

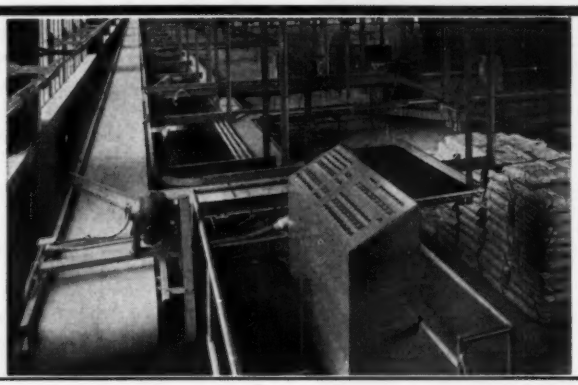
Powered Floor Sweeper . . . cleans a ton of bumpy, traffic-packed dirt in less than 5½ hours. In one operation it pulverizes hard-packed dirt and then picks it up. An illustrated bulletin, photos, performance data and traction-test results are available from G. H. Tennant Co.

Circle 114 on Reader Service Card

Dock Covers . . . protect workers while loading and unloading during inclement weather. Also protects merchandise. Eliminates accidents and loss of traction due to wet and slippery conditions. Full information is available from Dazzo Products Co.

Circle 23 on Reader Service Card

Increase Output



with Less Labor Cost...

use FERGUSON CONVEYORS

You can produce more with less labor cost when you let FERGUSON gravity or power conveyors do your materials handling. That's because these conveyors:

- **simplify, eliminate or combine many operations**
- **smooth material flow between production steps**
- **reduce manual lowering, lifting or shifting of material**
- **eliminate conjested areas**
- **reduce worker fatigue**

Labor savings and increased output quickly pay for FERGUSON CONVEYORS as our customers everywhere have found. That's why they constantly reorder these conveyors.

Write, wire or call for further details and let us bid on your material handling job.

HARRY J. Ferguson COMPANY

121 WEST AVE. • JENKINTOWN, PA.
PHONE: TUrner 4-4401

Circle No. 32 on Reader Service Card for more information

CATALOGS

Continued

Heavy Duty Trailers . . . in capacities up to 60 tons. Built on a structural steel channel frame having three or more lengthwise members, these trailers are topped with decks of heavy steel plate. Available in sizes to meet your requirements. Literature is offered you by Thomas Truck & Caster Co.

Circle 88 on Reader Service Card

Bag Closing Machine . . . for making low cost tape-bound closures on large multiwall paper bags is the subject of Bulletin No. 200 offered by Union Special Machine Co. A single foot pedal controls synchronized conveyor and sewing head. Machine is quickly adjustable to any bag height.

Circle 109 on Reader Service Card

Tape Dispensers . . . the Derby 32-T gummed tape dispenser has an easily removed snap-out blade and is designed to dispense Kraft and reinforced tapes for the shipping room and production line. A seven day free trial is offered by Derby Sealers, Inc.

Circle 113 on Reader Service Card

Shipment Addressing . . . is the subject of a booklet, "How to streamline your shipment addressing for speed and economy" offered by Weber Marking Systems Div. of Weber Addressing Machine Co., Inc. It describes seven modern systems for fast, efficient addressing of labels, tags and cartons and is packed with helpful ideas.

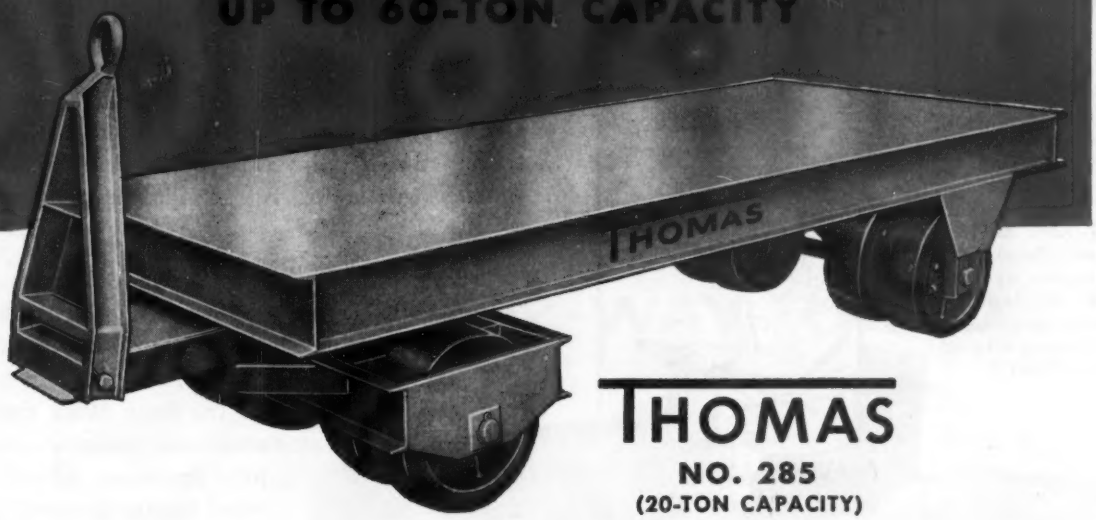
Circle 122 on Reader Service Card

Junior Case Sealer . . . which is said to be a shorter, narrower, simpler, and better performing case sealer is the subject of literature available from A-B-C Packaging Machine Corp. This machine automatically seals corrugated shipping containers in a fraction of the floor space ordinarily required.

Circle 130 on Reader Service Card

HEAVY DUTY TRAILERS

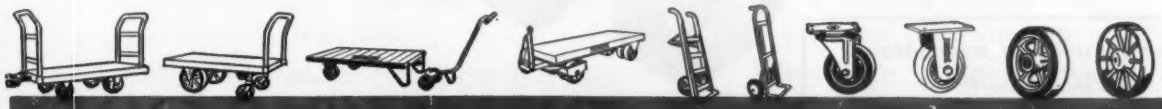
UP TO 60-TON CAPACITY



THOMAS
NO. 285
(20-TON CAPACITY)

THOMAS can produce the trailers you need in capacities up to 60 tons. Built on a rugged, structural steel channel frame, having three or more lengthwise members, these trailers are topped with decks of heavy steel plate. Available in "Job-Suited" sizes and with stake pockets located to meet your exact materials handling requirements. The heavy-duty, double ball race fifth wheel assures easy maneuvering with any load. Usually ordered with ring-type "Safety" tongue which will not drop to the floor. Your choice of rear coupler. Available with steel or rubber-tired, roller bearing wheels.

There is a THOMAS Representative in every Trade Area. Write for free literature describing the complete line of THOMAS "Job-Suited" Trailers, Trucks, Casters and Wheels.



THOMAS TRUCK & CASTER CO.

615 MISSISSIPPI RIVER, KEOKUK, IOWA

Circle No. 88 on Reader Service Card for more information

SHOP MULE Tractors

offer you . . .

SHOP MULE tractors in the TG Series have drawbar pulls of 2,400 or 3,000 lb.

HB and HA Series tractors have drawbar pulls from 7,500 to 12,000 lb, and are offered with torque converter or standard drive. JG Series tractors (not shown) have drawbar pulls of 3,000 or 5,000 lb.

Compactness Watch an Allis-Chalmers SHOP MULE tractor in action and you will see there is a big difference in wheel tractors for industrial use. You will notice how its efficient, compact design suits it *specifically* for factory or warehouse aisles.

Maneuverability The SHOP MULE tractor will have to *show* you how it can pack so much capacity into so small a turning radius. Some models require less than ten feet. But the SHOP MULE tractor is more than a good worker. It is easy to maintain.

Dependability Its Allis-Chalmers engine is noted throughout industry for unusual durability. Further, when the tractor needs servicing attention, it can be stripped in minutes, and many parts are interchangeable with other Allis-Chalmers units.

Models to fit the job There are 30 models and sizes — 15 gasoline, 15 diesel — with drawbar pulls up to 12,000 lb. Ask your Allis-Chalmers Material Handling dealer to let the SHOP MULE tractor *show you* what you can expect from an industrial wheel tractor designed specifically for your job.

See these other examples of *Allis-Chalmers Engineering in Action* . . . in action against handling and maintenance costs.

Platform Trucks

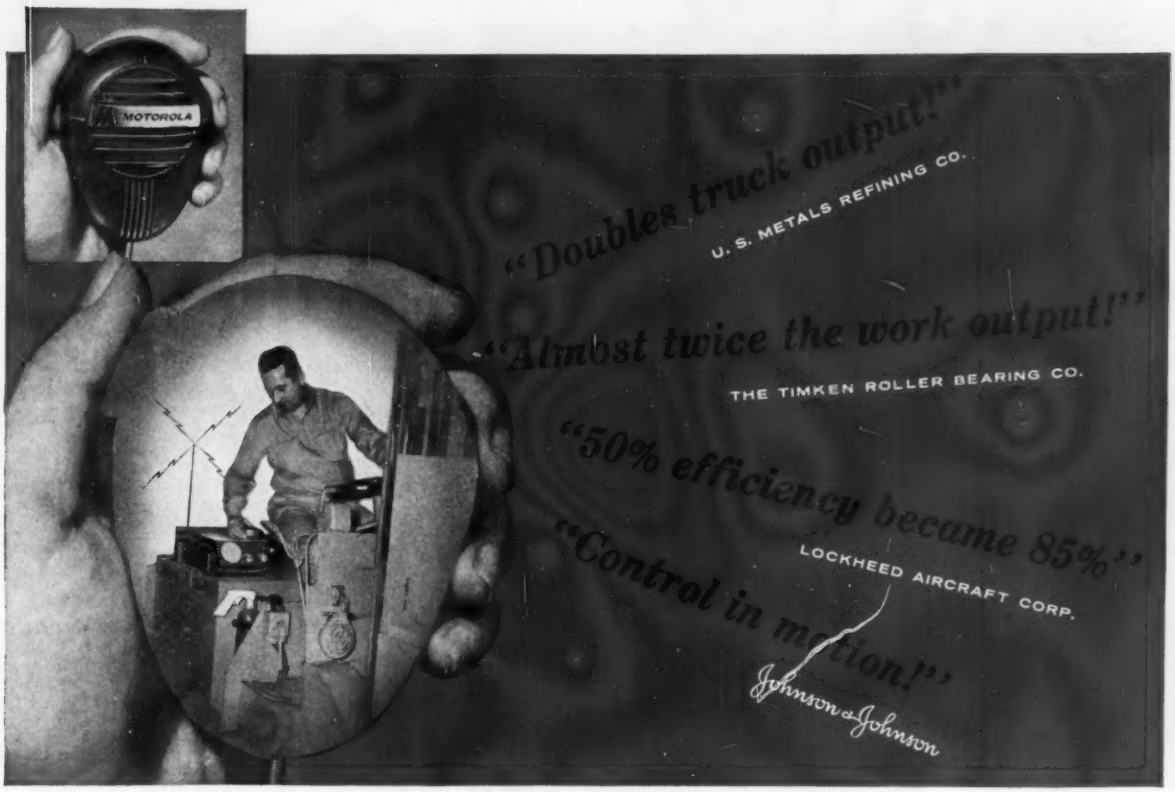
Fork Lift Trucks

BH-31

MATERIAL HANDLING DEPARTMENT, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

A-C ALLIS-CHALMERS

ALLIS-CHALMERS



They're all talking about MOTOROLA 2-WAY RADIO

Every day modern industry is saving *thousands* of dollars with Motorola 2-way radio.

Radio slashes handling costs—not by a few percent—but often by 50% or better. Radio gets vehicles to the right place at exactly the right time, and when one job is completed, moves them *directly* to the next. The dispatcher knows where all vehicles are at all times—can pre-plan the flow of materials—change plans to accommodate rush jobs in seconds with radio.

Straddle trucks, loaders, cranes, tractors, fork lift trucks, switch engines—all do a much more efficient job with radio. In fact, records show that Motorola 2-way radio often pays for itself in *months*.

And you keep right on collecting dividends because it is *proved to last longer* under the toughest industrial applications. Motorola, the pioneer and leader, makes the greatest variety of equipment and offers more exclusive features. Learn how you can get *full* output from your materials handling vehicles from a Motorola Communications Engineer. Write, phone or wire TODAY!

MOTOROLA *2-WAY INDUSTRIAL RADIO*

Motorola Communications & Electronics, Inc. • A Subsidiary of Motorola, Inc. • 4501 W. Augusta Boulevard, Chicago 51, Illinois

Circle No. 160 on Reader Service Card for more information

Circle No. 101 on Reader Service Card

NEWS VIEWS TRENDS

EDISON LAUNCHES NEW PROGRAM FOR DEMONSTRATIONS

A new plan for supplying industrial batteries for demonstration anywhere in the nation has been announced by Edison Storage Battery Division of Thomas A. Edison, Inc. According to George E. Strongfellow, senior vice president and division manager, Edison will ship batteries to truck manufacturers or their agents, when the batteries are requested for demonstrations in plants, factories and other locations. The batteries will be the precise size and of the correct capacity for the various types of trucks.

MERCURY ABSORBED IN STOCK MERGER

Pettibone Mulliken Corporation has announced the acquisition of the Mercury Manufacturing Company, in an exchange of stock. According to E. J. Seifert, president of Pettibone Mulliken and new Mercury board chairman, Mercury will retain its present location, personnel and distributors, and will continue in the manufacture of its line of tow tractors, electric lift trucks and trailers.

NEW AMERICAN CHAIN & CABLE PLANT

With the recent breaking of ground, the first phase of a two-year expansion and modernization program was initiated at the Wright-Manley facilities of the American Chain & Cable Company, Inc., York, Pa., according to E. J. Williams, vice-president of operations. The first phase of the project is a new 20,000 square foot receiving and raw stores building. Work on clearing the site for this building has already begun, with construction scheduled early in 1957.

AMERICAN MONORAIL FORMS PACIFIC BRANCH

The American MonoRail Company has announced the formation of the American MonoRail Pacific Coast Division, with offices in Los Angeles, California. The new division will be headquarters for the manufacture and shipping of most all types of the firm's monorail parts and equipment in that area, according to spokesmen for the company.

LINK-BELT EXPANDS WESTERN FACILITIES

Link-Belt Company will build a new plant in Montebello, California, a suburb of Los Angeles, according to Robert C. Becherer, president. The new structure will replace and expand the firm's present facilities in Los Angeles. Ground will be broken in spring, and it is expected the plant will be completed and in operation by November of this year. The Montebello plant will more than double Link-Belt's present manufacturing facilities in the Los Angeles area, and will also house the company's factory branch store and district sales office.

CLARK OPENS "MICHIGAN" PLANT IN CANADA

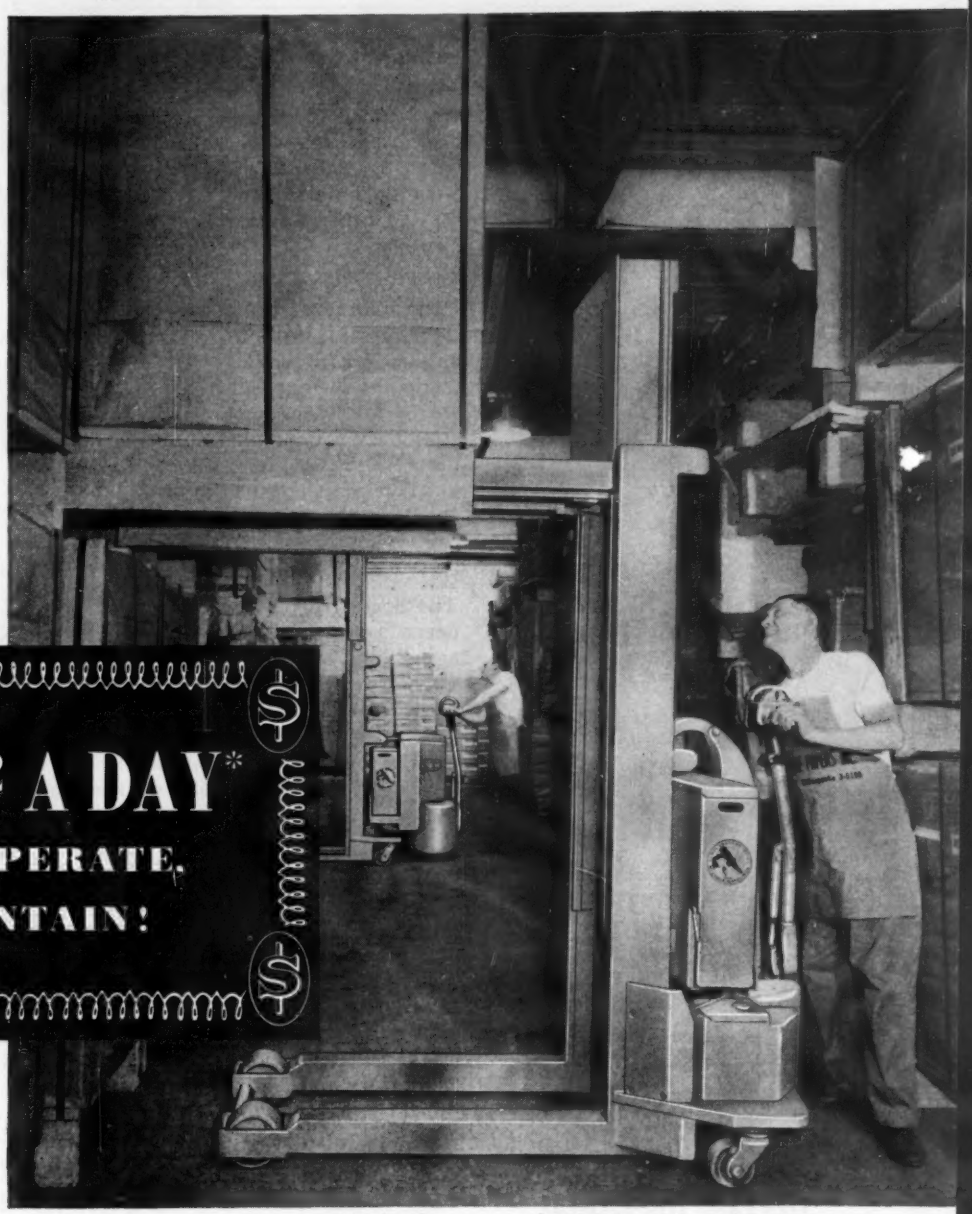
Canadian Clark, Ltd. recently held a two-day open-house to mark the formal opening of its new 52,000 square foot manufacturing plant in St. Thomas, Ontario. Now in production at the new plant are three models of rubber tired "Michigan" tractor shovels, ranging in capacity from 1 to 2¼ cubic yards. In 1957 a fourth model will be added, as well as the "Michigan" Pulpwood Logger.

L-S ELECTRICS FOR LIFT TRUCK SAVINGS

BERKSHIRE PAPERS, INC.
CHICAGO, ILLINOIS
REPORTS

WAREHOUSE CAPACITY INCREASED . . .	50%
STOCK HANDLING DECREASED . . .	50%
MANPOWER COSTS REDUCED	40%
STOCK RECEIVING TIME DOWN . . .	25%

PLUS . . .



ONLY $2.82 A DAY*

TO OWN, OPERATE, AND MAINTAIN!

*Based on 5-year average of equipment, operating, and maintenance cost

When Berkshire Papers, Inc. of Chicago turned to narrow-aisle, high-tiering Lewis-Shepard JackStackers the results were immediate and phenomenal. But even more amazing than solving so many problems, L-S JackStacker "Walkie" Electrics cost Berkshire Papers only *$2.82 per day per truck to own, operate, and maintain.*

Clean, silent, fumeless operation makes L-S electrics ideal for warehouse work. Exclusive "lubricated for life" design, and no under-truck adjustments, push maintenance costs down. But topping everything else, you get an extremely rugged, highly maneuverable truck that right-angle stacks 48" loads in aisles less than 6'0" wide. Lift heights to 180". Capacities to 6000 lbs.

Face tight aisle space, plus the need for *exceptionally* high stacking? Inquire about *low-cost* L-S JackStacker "walkie" models. Available in straddle pallet, platform and counter-balance models.

Here's a list of important companies that have recently re-ordered L-S JackStackers:

Aircraft Mfgr.	has 20 L-S in use	reordered 4
Electrical Mfgr.	has 121 L-S in use	reordered 8
Automotive Parts Mfgr. . . .	has 32 L-S in use	reordered 5
Rubber Goods Mfgr.	has 18 L-S in use	reordered 3
Photographic Supplies Mfgr. . .	has 44 L-S in use	reordered 2

L-S **LEWIS-SHEPARD®**
The most complete line of materials handling equipment anywhere

131 Walnut Street, Watertown 72, Mass.

The "MASTER" Line

Please send ☐ *L-S JackStacker Catalog No. 34-1*
☐ *L-S Complete Line Catalog*

Name.....

Company..... **Title**.....

Address.....

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Continued

AMF PLANS NEW RESEARCH CENTER

American Machine & Foundry Company's plan for a research and development center in Stamford, Conn. has been announced by Morehead Patterson, AMF board chairman and president. Located on a 38½ acre site, the proposed center will consist of an administration building and five laboratories, and will be headquarters for the firm's Central Engineering Laboratories.

MARKS 25TH CATERPILLAR DIESEL ANNIVERSARY

Caterpillar Tractor Co. recently celebrated the 25th anniversary of its successful introduction of the modern, mobile heavy-duty diesel engine. In November, 1931 the firm manufactured the first commercially designed diesel specifically for use in a crawler tractor. It represented a pioneering step in freeing the diesel from its stationary foundations and putting it to work as a mobile power unit. Since that time, Caterpillar's engine line has grown rapidly, until today it consists of 15 industrial engines, 10 marine engines and 12 diesel-powered electric sets.

ANNOUNCES 1957 SIPHME SHOW PLANS

The Society of Industrial Packaging and Material Handling Engineers has revealed complete plans for the National Industrial Packaging and Handling Exposition of 1957, to be held in Atlantic City, New Jersey, October 28 through 31. As in past years, the show will include the SIPMHE Short Course and the National Packaging and Material Handling Competition. According to spokesmen, the show will accent the theme, "What's New—How To Do It", in the field of industrial packaging, handling and transportation.

NEW HUSCO PLANT ADDITION

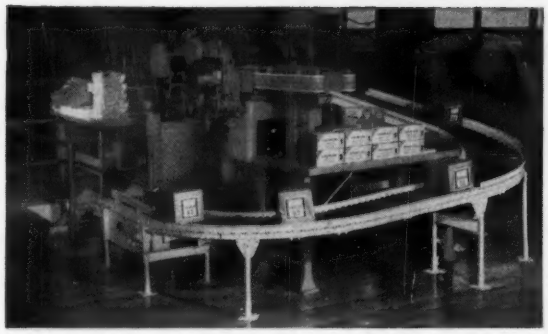
Hydraulic Unit Specialties Company, manufacturer of hydraulic valves and controls, has recently completed a large new addition to its plant in Waukesha, Wisconsin. The new modern structure provides a 100 percent increase in floor space for the company, and practically quadruples the production facilities available at Husco only two years ago. In addition to the increased production capacity, the addition also permits greatly expanded engineering, laboratory and testing operations.

AMERICAN DECAL OFFERS RESEARCH PLAN

The American Decalcomania Co. has announced the inauguration of a special research and production department, designed to answer the requirements of coated paper label users who have problem applications, or who require special adhesives or coated stocks to meet unusual demands. According to the company, the research facilities of its new "special adhesives" label department are available without obligation to paper label users having a "problem application".

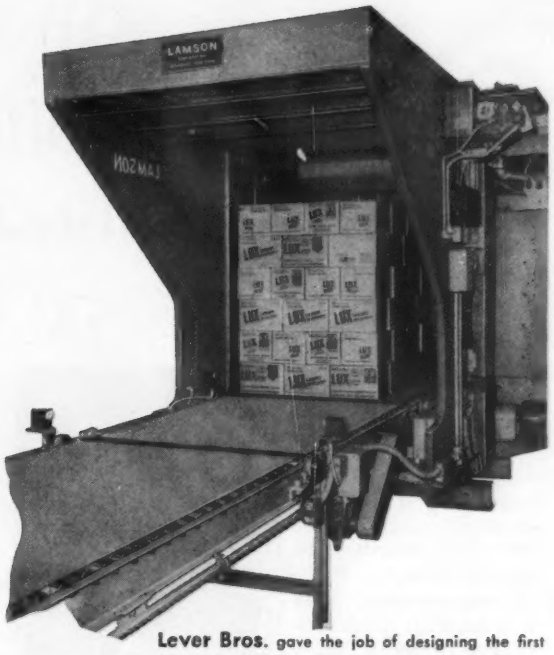
REVEAL PLANS FOR WEST COAST SHOW

Plans have been announced for the Third Western Plant Maintenance and Engineering Show and Conference, which will be held in San Francisco, June 11 through 13. Last held in 1955 in Los Angeles, the show featured 113 exhibits, and attracted over 6000 western plant maintenance and engineering personnel. It is estimated the 1957 show will have an increase of over 2500 in attendance, and 35 percent more exhibits over the last event.



National Biscuit Company's giant new bakery in Chicago is completely equipped with Lamson engineered conveyors.

Robertson Heating Supply Co., Alliance, Ohio, uses a Lamson Overhead Tow System to speed its order filling.



Lever Bros. gave the job of designing the first Automatic Palletless Loader to Lamson engineers.

do you move products like Coolies built the great wall... by hand?

Systematic work on the Great Wall of China began in 228 B.C., and was finally completed in 1644 A.D. Reaching a length of about 1400 miles, it is a testament to the back-breaking work of literally hundreds of thousands of Chinese. Today, you can't afford to move your products "Coolie-style."

In the package conveyor field, Lamson offers the broadest line. Nationally known companies depend on Lamson to engineer and install belt, gravity and live roll conveyors; continuous trolley systems; reciprocating vertical conveyors of all types; continuous combing verticals; and a broad line of automatic and semi-automatic pallet loaders.

Why not talk over your conveying problems with a Lamson engineer? He'll show you ways to cut costs and meet production schedules.

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Offices in Principal Cities

- ☐ Have an engineer call me for an appointment.

Send me these bulletins:

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- ☐ 28-page Roller Gravity Bulletin
- ☐ "Utilize the Air Rights"
- ☐ "Automatic Pallet Loader"

221

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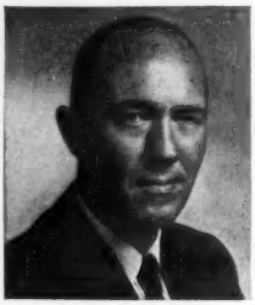
MEN in the NEWS

At **Morse Chain Company** . . . the election of **Robert O. Bass** as executive vice president and assistant general manager has been revealed, according to **Stanley J. Roush,** president of Morse, a Borg-Warner company. Bass will have his headquarters in Ithaca, New York, and will be responsible for the firm's operations in Ithaca, Detroit, Michigan and Simcoe, Ontario. Prior to this appointment he was president of the Eberhardt-Denver Company of Denver, Colorado, and he will continue in that capacity.



Robert O. Bass

At **Yale & Towne Manufacturing Company** . . . the promotion of **Francis J. Dunleavy** as assistant general manager of the Material Handling Division has been announced by **John A. Baldinger,** general manager. Dunleavy succeeds **John T. McCarley,** who has been named general manager of Yale's new west coast plant under construction in San Leandro, Calif. In his new position he will assist in the operation of the company's Philadelphia plant. Prior to this appointment, he had been director of pricing and budget control for the division.

At **National Vulcanized Fibre Co.** . . . at the company's recent board of director's meeting, **Roy S. Fisher** was elected vice president and named director of sales. In his new capacity, he will direct the sale of all of National's industrial and consumer products, to both domestic and overseas markets. Before being appointed manager of sales in 1955, Fisher had been manager of the Cleveland-Pittsburgh-Cincinnati territory for 24 years.

Roy S. Fisher

At **Monarch Rubber Company** . . . the president and board chairman of the company, **Robert J. Himmelright,** passed away recently after a short illness. His age was 58. Himmelright, with his brother Paul, organized Monarch Rubber in 1921. When his brother died in 1940, he became head of the firm.

At **Container Laboratories, Incorporated** . . . **James A. Sargeant** has been recently elected vice president, according to **Allyn C. Beardsell,** president. Before joining Container Laboratories in 1953, Sargeant had been chairman of the Army Packaging Board, and chief of the Packaging Section of the Army general staff.

James A. Sargeant

At **Jeffrey Manufacturing Company** . . . **H. J. Halliday,** formerly purchasing agent for the firm, has been appointed to the position of director of purchases, according to a recent announcement from the firm. At the same time, three divisional purchasing agents were also named. They are **C. A. Lane,** Industrial Division; **C. E. Firestone,** Mining Division; and **E. L. Corwin,** Machinery and Factory Supplies.

At **Borg-Warner Corp.** . . . the election of **Henry M. Haase** as vice president of engineering and research has been announced by **Roy C. Ingersoll,** chairman of the board. Haase came to Borg-Warner in January, 1955 as assistant to the president. In his new capacity he will direct the corporation's program of product planning and engineering research and development, including general supervision of the new Borg-Warner Research Center in Des Plaines, Illinois, and the Petro-Mechanics Research Division in Los Angeles. Prior to joining Borg-Warner he had been president and general manager of McCray Refrigeration Co., Palmer Manufacturing Corp. and subsidiaries.

(Continued on page 50)

Presenting Automatic's

ALL NEW Stacker Model

Transporter

Completely Redesigned...New in Every Detail

Lowest priced stacking equipment of its kind that handles all kinds of pallets. The TRANSPORTER Stacker sets standards of economy, maneuverability, safety and low cost maintenance not matched in any comparable truck.

Among other improvements are fastest lift, for speedier stacking...shortest overall length for easier maneuvering...split ring bearing race reduces steering friction, makes turning easier...dual tilt rams increase load stability...easy access simplifies maintenance, cuts cost...improved weight distribution insures greater overall stability and safety.

But there are many more features, all equally important to every industrial truck user. Write for complete details.

BALL BEARING ROLLER-MOUNTED CHANNEL AND CARRIAGE
Heavy action, rolled manganese alloy steel uprights offer superior rigidity and strength... negligible friction and wear...need little or no maintenance.

Exclusive New Features Simplify Operation and Maintenance... Reduce Down Time...Cut Costs

ALL NEW 3-SPEED BUTTERFLY CONTROL
Prevents too-fast starts... permits inching with smoothness and precision never before possible.

ALL NEW SIMPLIFIED FULLY ENCLOSED ALL-GEAR DRIVE
Extreme simplicity permits extra-heavy construction—tremendous reserve strength—effective insurance against down-time.

ALL NEW SIMPLIFIED HANDLE ACTUATED BRAKE
New simplified design permits smoother, more positive action. Spring pressure is adjustable to meet special requirements.

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WORLD'S LARGEST EXCLUSIVE BUILDER OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

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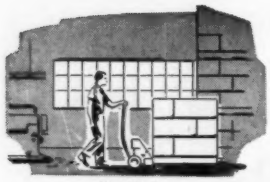
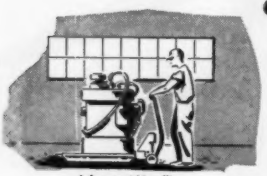
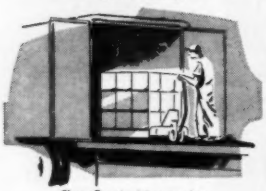
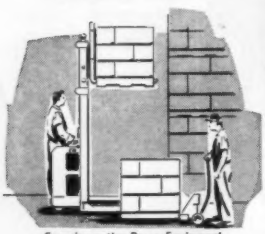
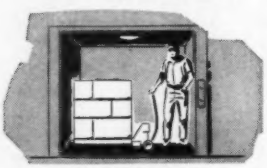

Short Hauls

This truck suits 'em all!


Infrequent Handling


Close-Quarter Maneuvering


Complementing Power Equipment


Light-Capacity Elevators-Floors

In-Process Handling

RAYMOND®

Lightweight • Hydraulic

PALLET TRUCK

MODEL L2P
Capacity 2,000 lbs.

WORLD'S MOST POPULAR pallet truck because it does so many jobs so well. Superbly built to withstand years of use and abuse.

LIGHTWEIGHT . . . lessens operator fatigue.

EASY TO MANEUVER . . . easy to pull . . . patented booster roll permits effortless pallet entry.

CONVENIENT FOOT PEDALS lift and lower your load.

• Completely precision hydraulic for dependable operation. Has aluminum alloy construction, husky one-piece welded steel frame, safe dual-purpose brake, 270° turning radius.

Mail Coupon for full details!

The RAYMOND CORPORATION

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MEN IN THE NEWS

Continued

At **The Landahl Conveyor Company** . . . the board of directors has been increased from three to five members, and new officers have been elected for the firm, which is a subsidiary of **The American Monorail Co. C. L. Fell** is the new president, **C. E. Barner** is vice president, and **R. H. Miller** is the new secretary and treasurer. **Carl Harris** and **J. L. Pischke** were re-elected as directors.

At **Globe Hoist Company** . . . directors of the company have just elected **Fred W. Swanson, Jr.** as chairman of the board. Swanson becomes executive head of the Globe organization comprising manufacturing plants in United States, Canada, Australia and England.

At **Crown Zellerbach Corporation** . . . the board of directors has elected **Alfred B. Layton** president and **Reed O. Hunt** executive vice president. Layton and Hunt share executive responsibility in a new pattern of group management of the paper company, replacing **J. D. Zellerbach** and **H. L. Zellerbach** respectively, who are retiring from active management. J. D. Zellerbach becomes chairman of the board of directors, and H. L. Zellerbach was elected chairman of the board's executive committee.

At **Bemis Bro. Bag Co.** . . . **A. V. Phillips,** retired director and veteran of 62 years service with Bemis, died recently following complications resulting from a fall. He was 88 years old. Phillips joined the company in 1891, was made a director in 1911, and became vice president in 1912. He had resigned from the board of directors in 1953.

At **Bulldog Pallet Co.** . . . vice presidents **Gordon W. Dennis** and **Roy Sjolund** have been elected to the board of directors of the Newark, California, pallet manufacturing firm. Announcement of the election was made by **Richard M. Duff,** Bulldog's president and board chairman.

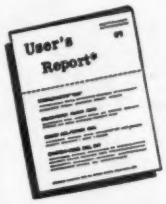
At **Allis Chalmers Manufacturing Company** . . . **Enoch While,** chief inspector at the company's Northwood, Ohio works since 1947, has been named works manager there succeeding **J. F. Costigan,** recently appointed assistant director of manufacturing, Industries Group. **R. C. Lathrup,** formerly While's assistant, succeeds him as chief inspector, and **C. E. Wikoff** becomes assistant chief inspector.

At **American Hoist and Derrick Company** . . . executive vice president **R. J. Stoddard** recently announced that **John W. McEvoy** has been named vice president and general manager of the **Lebus Manufacturing Company,** a wholly owned subsidiary of American Hoist. McEvoy was formerly works manager of the American Hoist plant at South Kearny, New Jersey, and more recently superintendent of structural works at the St. Paul plant.

At **Crescent Metal Products, Inc.** . . . the appointment of **Harold McCarthy** as director of purchases is revealed. McCarthy's appointment fills a new position in the company.

At **M-H Equipment Company** . . . the November issue of FLOW erroneously reported that John R. Brown had been appointed to the position of assistant to the president. Actually, the correct name of the new appointee is **John R. Bowen.** Our apologies for the slip.

The RAYMOND CORPORATION
3318 Madison St., Greene, N.Y.



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Please send me your new "User's Report" describing the handling of _____ (PRODUCT)

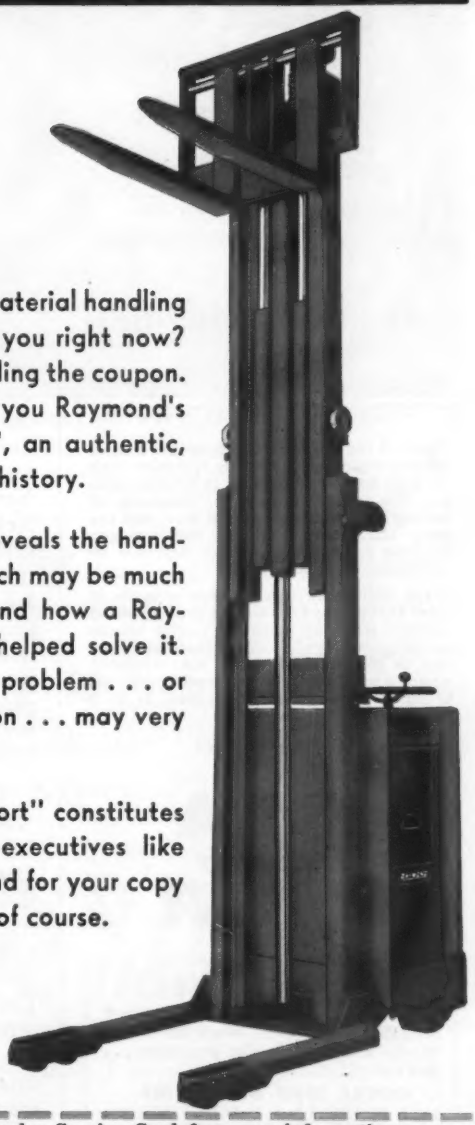
CLIP & MAIL THIS COUPON

Before you buy another electric truck . . .

HOW HAVE OTHERS SOLVED the material handling problem which faces you right now? You'll find out by mailing the coupon. Because it will bring you Raymond's new "User's Report", an authentic, fully-illustrated case-history.

This concise report reveals the handling of a problem which may be much like your own . . . and how a Raymond Electric Truck helped solve it. The solution to your problem . . . or an idea for its solution . . . may very well be described.

Our new "User's Report" constitutes "must" reading for executives like yourself. Why not send for your copy now? No obligation, of course.



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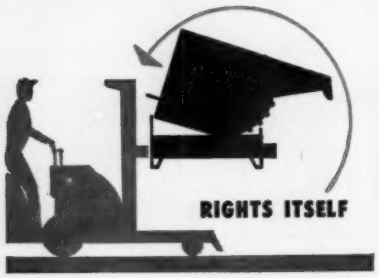

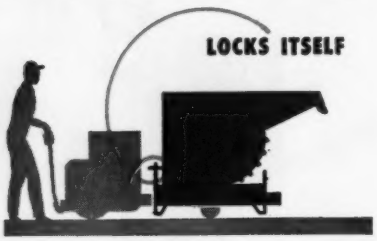

Cuts hand unloading costs 50% or more

Figure it out yourself. Compare the cost of this one-man semi-automatic operation with the time and labor involved in hand-unloading. The answer is obvious. Hundreds of leading industries have proved it . . . and are using thousands of Roura Self-Dumping Hoppers for handling wet or dry, hot or cold bulky materials.

Roura builds 'em rugged. They're made of extra heavy gauge metal with sturdy welded joints to stand up under the terrific knocks and bangs of rough handling. Fit any standard fork or platform lift truck. Also available mounted on live skids—casters with malleable or rubber tired wheels. Sizes from ½ to 2 cubic yards.

Let Roura help *you* cut costs.

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Self-Dumping
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WANT MORE FACTS?
We'll give you full details . . . without obligation . . . if you'll attach this coupon to your letterhead . . . sign your name . . . and mail to . . .

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NEWS *from the* SALES FIELD

C. R. Dean, Jr.

Clyde R. Dean, Jr., director of export sales of Yale Material Handling Division, **The Yale & Towne Manufacturing Company**, has been promoted to general sales manager, according to **John A. Baldinger**, general manager. The new general sales manager has spent his entire career, almost 20 years, in the material handling industry, and has been with the Yale sales organization since 1954.

R. A. Willson

R. A. Willson has been appointed to the position of district manager of the New York and New England territories of the Wright Hoist Division of **American Chain & Cable Company, Inc.**, according to an announcement by **S. J. Woodworth**, sales manager. For the past four years Willson had been district manager of the firm's Los Angeles office.

Lewis-Shepard Products, Inc. has named **Marshall Dreitzler** as a sales representative in the Chicago area, for its complete line of electric fork trucks and related material handling equipment. Dreitzler will make his headquarters at the company's Chicago factory branch, which offers complete sales and service facilities.

R. M. Tobin

Robert M. Tobin has been appointed sales manager of the Powrworker Section, Industrial Truck Division, **Clark Equipment Company**, according to **L. A. DePolis**, general sales manager. Tobin came to Clark in 1952 as a project engineer, and in 1954 was made assistant to the sales manager of the Powrworker Section. He became acting sales manager in 1955.

John E. Moody has been appointed district manager of the Boston industrial district sales office of **Joy Manufacturing Co.**, replacing **Don L. Archibald**, who takes over the newly-formed New York office. Moody had previously been a salesman in Joy's Chicago office.

Edward L. McCabe has been promoted to sales manager of the Philadelphia branch, Exide Industrial Division of **The Electric Storage Battery Company.** Now in charge of all Exide industrial battery sales in eastern Pennsylvania, southern New Jersey and all of Delaware, McCabe was formerly assistant sales manager of the branch.

Republic Steel Corporation has appointed **Lee Keller & Associates**, Grand Rapids, Michigan to handle the sale and distribution of Republic material handling equipment in that area. This equipment, made by Republic's Pressed Steel Division, includes steel pallets, and skids, and rigid and collapsible steel boxes.

The appointment of **James MacCracken Adair** as sales manager of the Dynamatic Division of the **Eaton Manufacturing Company** has been announced by **F. L. Hopf**, general manager of the division.

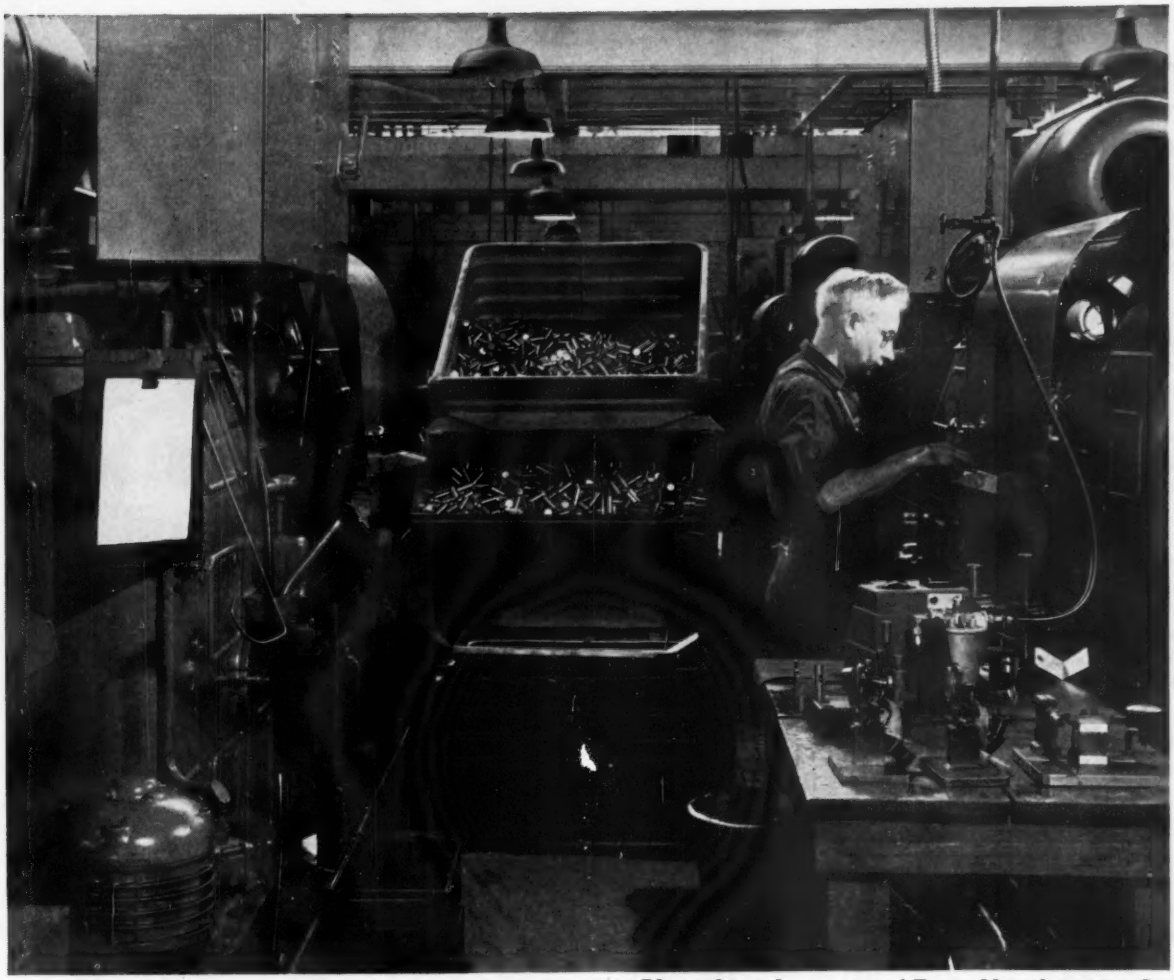

Photo through courtesy of Eaton Manufacturing Co.

MASS PRODUCTION means mass handling . . . and no other handling system can match the **Powell Flowmatic*** when it comes to smoothly and efficiently moving volume parts and materials in process. Watch it in action . . . talk with those using it and you'll understand why Flowmatic* is called the *"hottest thing in handling in a decade."* Literature upon request.

*Patent: No. 2762529

127

POWELL PRESSED STEEL SINCE 1920

POWELL *flow-mation** SYSTEMS

The Powell Pressed Steel Co. Hubbard, Ohio

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(Advertisement)

TIPS ON TRUCKS

Records show electric trucks cost less to maintain

Electric trucks . . . or gas trucks? Which should you choose? Which should you use?

Where a choice of gas or electric trucks exists, it is wise to choose the electrically powered type. Facts show that except under the most abnormal conditions of outdoor operation, and where the trucks will be subjected to excessive abuse, your electric trucks will outperform the gas trucks practically every time.

Wherever records have been kept, it is interesting to observe that electric trucks, on the average, are available for duty longer. Downtime with electrics is held to a bare minimum. According to the logs, downtime and maintenance costs for gas trucks run two, three, even four times that of electrics.

The right type battery can make a big difference

An electric truck is built to deliver more value per dollar—right from initial purchase, through every day of its long worklife. But to get the most out of the modern electric truck, it takes a modern "power plant" as well.

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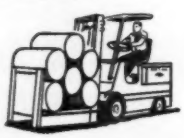

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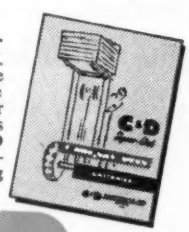

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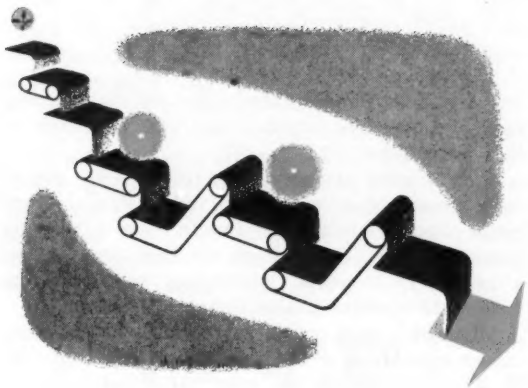
Mechanized Metal Treating and Finishing

COMPLETE MECHANIZATION of Heat Treating ...a growing trend

By O. E. Cullen, Chief Metallurgist, Surface Combustion Corporation, Toledo, Ohio



Fully conveyorized heat treating departments are the logical addition to complete shop "automation" for maximum efficiency. Planning the mechanized heat treat layout calls for ingenuity. No one system is foolproof, universal. But most floor arrangements can be adapted to either the integrated or dispersed pattern. Here are examples from latest installations.

MECHANIZED heat treating equipment is effectively pointing the way to automation in the heat treat shop. Already in operation are many completely mechanized heat treating departments. Individual heat treating processes are also being systematically integrated into the automatic production line.

The trend is unmistakable. As a result, current planning calls for mechanized heat treating equipment for those processes where size of product, speed of operation, or need for skilled operators previously discouraged a completely automatic setup.

Processes now being groomed for the "automatic look" include just about all types of heat treating and heating for hot forming. They include hardening, tempering, normalizing, annealing, carburizing, carbonitriding, and carbon restoring.

Justification for the trend to a more complete mechanization of all production facilities is simple logic. Obviously, the continuity of plant operations cannot be accomplished if heat treating facilities are dropped from the overall plan and shunted to an isolated portion of the plant.

It is equally clear that not all heat treating facilities can be conveniently transferred directly to the production line. But amazing compromises are being worked out every day.

Certain phases of heat treating may never be fair game for total automation. For example, metal parts of

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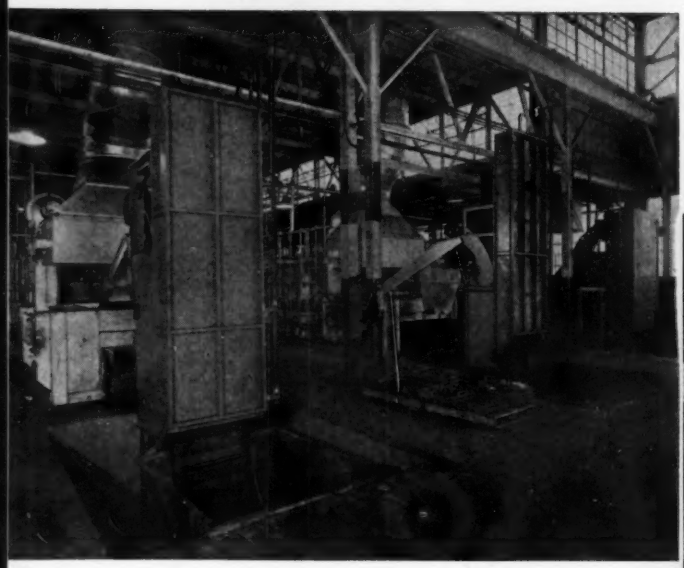
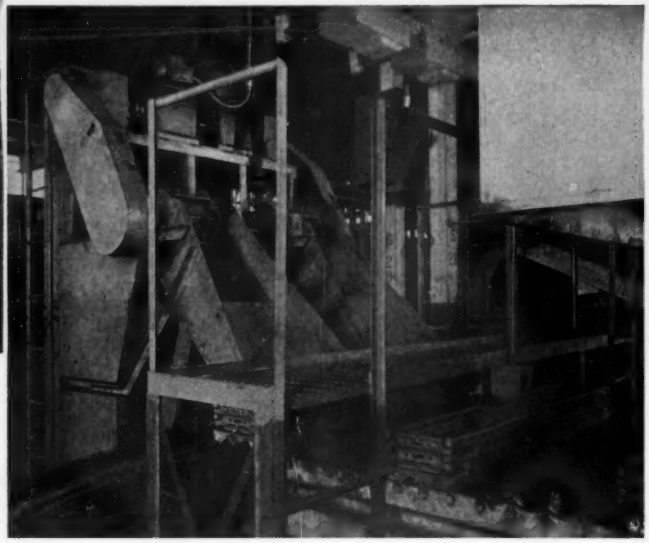


FIG. 1 (LEFT): THREE VERTICAL LOADERS convey parts to charge end of each heat treat line. Recessed hoppers are kept filled by overhead crane. FIG. 2 (BELOW): Received in trays, work is carried by belt through complete annealing cycle. Note the return for empty trays which can be seen at lower left.



such size or condition that their heat treatment must be carried on in specialized areas might not be handled economically in any other way. This does not imply that automation must be confined to a single machine, department, or even one building in a production plant. Tying together all phases of heat treating in perfect sequence is complicated but not necessarily insurmountable.

The advantages of automation in heat treating have been mutually recognized by both users and manufacturers of equipment. Both are cooperating in the development of furnaces, atmosphere generators, and accessory handling equipment to meet immediate needs.

The forging industry presents a typical example of this cooperative spirit.

Most forgings are heat treated before machining or other finishing operations. Described below is a forging and heat treat area that is fully mechanized to handle forgings to and from diversified heat treating equipment by means of overhead handling systems. Heat treat cycles include hardening, tempering, and cycle annealing.

A combination of recessed floor level hopper and vertical hinged flight conveyor is provided for automatic loading at the charge end of each furnace line (See Fig. 1). This arrangement permits direct charging of the hoppers from overhead.

Parts are lifted from the hopper by the conveyor loader. They are subsequently dropped at specified intervals onto the belts of the harden and draw furnace lines or into trays provided for cycle annealing as Fig. 2 illustrates.

The automatic arrangement at the discharge end of each furnace combines inclined and vertical slot type hinge conveyors that automatically remove the parts from the water quench. Parts are then deposited on a system of overhead interchange belt conveyors feeding the mechanical blast cleaner (See Fig. 3).

All furnace lines are arranged to feed the cleaner interchangeably or at the same time. Cleaner capacity is about 700 pounds per hour. After the parts are cleaned, they are sorted into tote boxes according to type. (It is expected that conveyors will ultimately be used to move the various heat treated forgings to their respective machine lines.)

Annealing is done in a direct gas-fired cycle annealer of the two row pusher-tray type. It isothermally anneals forgings of 8617, 1117, and 1137 steels at a rate of about 2000 pounds per hour.

A typical 10-hour cycle involves heating to 1630 to 1680 deg. F, fast cooling to 1200 deg. F and holding

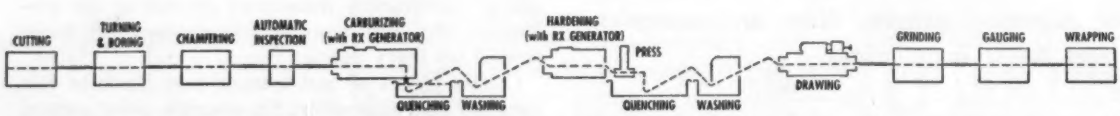


FIG. 4: COMPLETELY INTEGRATED, fully automatic production line turns out races on mass production basis.

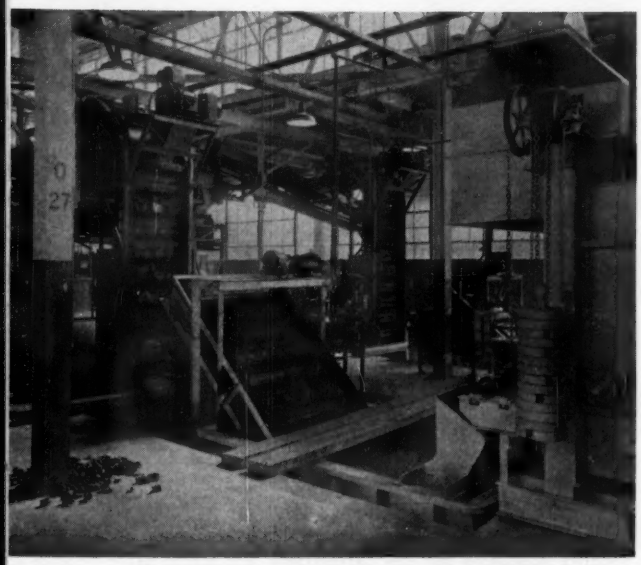


FIG. 3: ESCALATING from quench tanks, parts drop into hoppers. Vertical loaders then raise parts from each of the hoppers onto the overhead belt conveyers.

at this temperature, and finally discharging into water which is maintained at about 200 deg. F. The cool-down operation prior to water quenching minimizes shock and helps remove loose scale. Hardness is held at an optimum machining level.

The direct-fired harden and draw lines are of the continuous conveyor-belt type. Both 1140 and 1137 steel forgings are hardened on these lines. Quenching temperature is about 1600 deg. F., followed by a draw at 900 to 1300 deg. F., depending upon hardness desired. Capacities of these hardening furnaces run as high as 3000 pounds per hour.

Automatic Handling in Atmosphere Furnaces

Two common types of furnace lines, belt and revolving retort, are used for carburizing, bright hardening, carbonitriding, and carbon restoration of small parts. Figure 5 shows a portion of a belt-type furnace line providing for conveyance through the furnace, quench, wash, draw, and final cooling. Bolts, nuts, small forgings, ball and roller bearing parts, and small stampings are among the parts handled.

Handling is completely automatic from the time the work is placed on the vibrative feeder until it is discharged from the last operation of the heat treat line. In some instances, the supply of parts is brought directly from machines to a hopper and removed from the heat treat line on conveyors for direct delivery to the next operation.

Revolving retorts can also be used for both heat treating parts and conveying them between furnaces. With this type of equipment, uniformity of processing is assured, since the work is tumbled during its movement through the line. Such equipment lends itself to carburizing, carbon restoring, dry cyaniding, and bright hardening.

This type of equipment works most efficiently in the completely integrated, fully automatic production line shown in Fig. 4. It is being used to produce bearing races on a mass production basis. Cutting, machining, annealing, washing, carburizing, hardening, drawing, cooling and finish grinding are wholly integrated.

The rotating retorts are equipped with controlled atmosphere for both carburizing and annealing. Advanced methods for sealing and heating permit controlled carbon potential as well as quenching under atmosphere.

A similar type of integrated line is used to produce the journal crosses used with the bearing races. A combination of machining, hopper loading, metered furnace charging, rotary retort carburizing, quenching, washing, reheating, quenching for final hardening, washing and drawing all fit into an integrated line prior to final grinding.

To complete the automation feature of this plant required the further integration of a torque tube pro-

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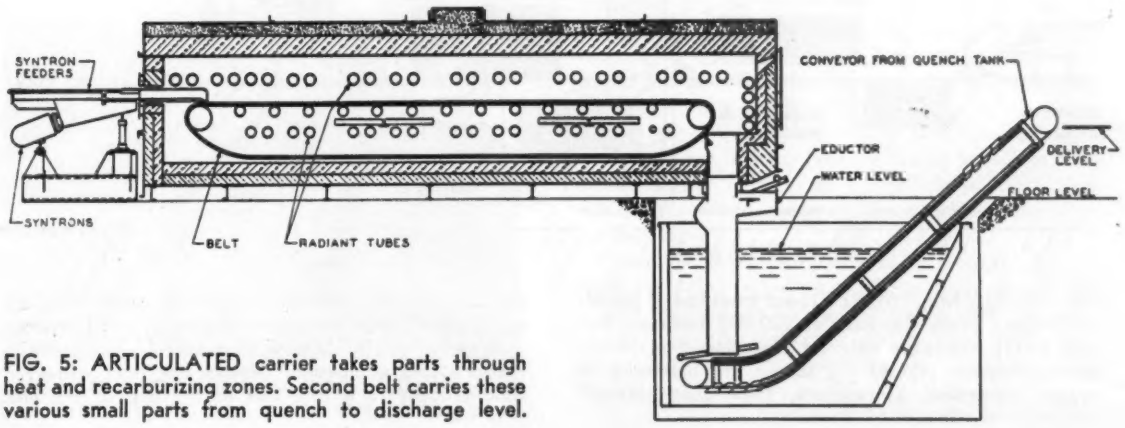


FIG. 5: ARTICULATED carrier takes parts through heat and recarburizing zones. Second belt carries these various small parts from quench to discharge level.

duction line. Steel strip is automatically uncoiled, roll formed, welded, cut to size, trimmed, stress relieved at 700 deg. F., water cooled, and conveyed to a final cut-off table.

This high production plant uses dispersed integration of a number of different furnaces. Each furnace handles a separate heat treating operation. The furnaces are so arranged among machine tools and other processing equipment as to allow for the complete automation of the entire installation.

Centralized Controls

An interesting feature is the method for centralizing control of all furnaces scattered throughout the plant. Overall quality control is maintained by the metallurgical laboratory. The same group supervises furnace operations very much as a set-up man follows a machine line. To facilitate control of the widely scattered equipment, a central "trouble" panel is used.

This L-shaped, control-indicating panel (Fig. 6) ties in with all of the individual drive mechanisms for conveyors, pumps, fans, and ignition systems for each furnace and prepared atmosphere generator. A green light signals satisfactory operation. A red light followed by an audible signal pinpoints trouble.

This one control panel hooks up with 13 continuous furnace lines, two special furnaces, and six prepared atmosphere generators.

Both endothermic and exothermic atmospheres are available. The generators are located at a central point directly behind the control panel. Atmospheres are manifolded and piped directly to each furnace. Enriching additions for gas carburizing are made prior to entrance into the particular furnace. A variety of mixers and valves have been installed to handle this operation.

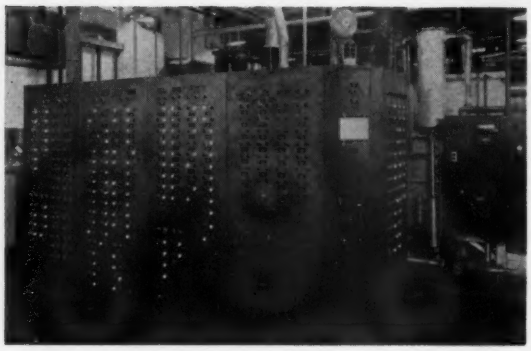


FIG. 6: CENTRAL CONTROL panel has signal lights to indicate "satisfactory" or "interrupted" operation of each of the critical components in the system.

All temperature indicating and controlling instruments are of the potentiometer type. They are located in an air-conditioned room next to the metallurgical laboratory. Each instrument is identified as to the furnace or generator it controls. Recording and indicating charts face the control room windows for convenience in checking without entering the air-conditioned room.

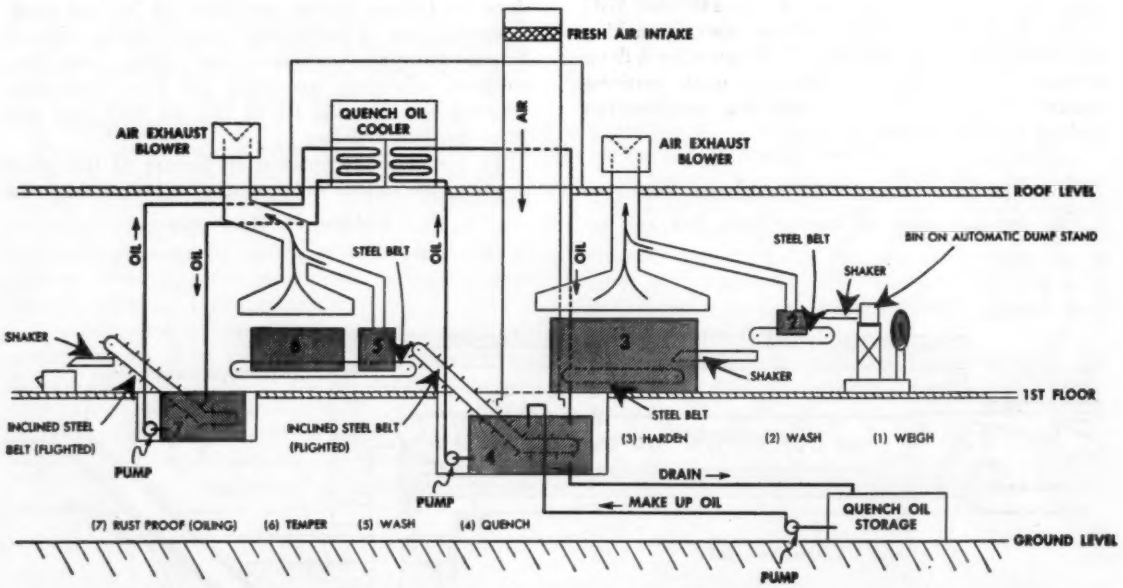
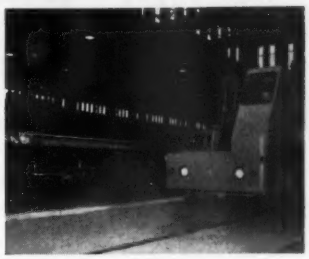


FIG. 7: FULLY MECHANIZED heat treat line at Standard Pressed Steel Co. handles 100,000 fasteners per hour. At (1), screws are weighed, then placed on shaker-conveyor-washer (2). At (3), screws are hardened in oxygen controlled atmosphere, then drop through curtain of oil into first quench tank (4), where they are cooled and moved to second washer (5) and tempered in draw furnace (6). Second oil quench (7) also contains rust-proofing compound. Screws are then conveyed automatically to a tote box at the end of the line.

PIPE IS LOADED in the storage yard (left), after being carried from the plant by side-loading fork truck.



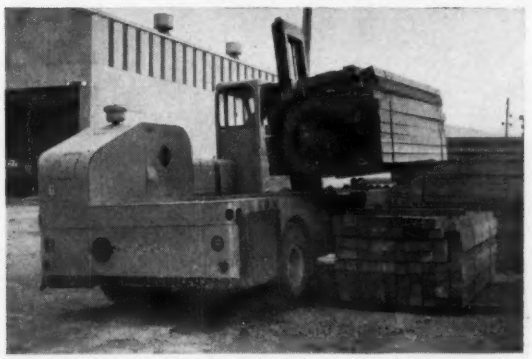
DELIVERING PIPE to conveyor for belling operation, the vehicle loads itself from a stack in storage yard, drives into plant, and unloads onto inclined rack down which pipe rolls to conveyor.

Pipe Mill Cracks Bottleneck

Handles pipe throughout plant and storage area with two side-loading fork lift trucks.

THROUGH the use of two side-loading fork lift trucks, over 24,000 feet of small-diameter pipe is handled in and out of a 23-acre storage area each day at the Consolidated Western Steel Division of United States Steel Corporation.

The company's Utah pipe mill uses only these two pieces of material handling equipment to load, unload, carry and stack long loads of pipe, at speeds sufficient to operate effectively throughout the entire plant as well as the huge storage area. The two trucks not only keep up with small-diameter pipe output, but also have free time for handling of lumber and large-diameter pipe.



LUMBER FOR DUNNAGE and flatcar stakes is carried by side-loaders when they are not busy handling pipe.

Primary duties of the two side-loaders are picking up pipe from a rack outside the mill and stacking it in the storage area, bringing pipe from storage to be loaded for shipment, and bringing pipe which is to be belled from storage to a conveyor system inside the plant.

Motorized roll conveyors are used to transport pipe inside the mill. The system delivers small-diameter pipe to a slanted rack outside the building, from which it rolls onto the side-loader decks. Large diameter pipe is usually shipped as fast as it is produced, and therefore seldom presents a storage problem. However, the mill does have provision for delivery of such pipe to an outside storage rack. In such cases pipe from the conveyors is lifted by movable arms directly onto the storage rack. However, pipe to be stored occasionally exceeds the number of pieces the rack can hold in a single layer; when this happens a side-loader lifts pipe up to form a second layer.

The side-loaders, which carry their loads lengthwise, need not turn to face the stacks on which they are to deposit or pick up a load. As a result, they can handle long loads without excessive clearance requirements.

Consolidated Western also uses the trucks to unload, stack and bring to the point of use the lumber which is used for dunnage and flatcar stakes. The plant also has a truck-mounted crane and a locomotive crane which handle large diameter pipe and incoming lumber and plate.

Courtesy of the Baker-Raulang Company

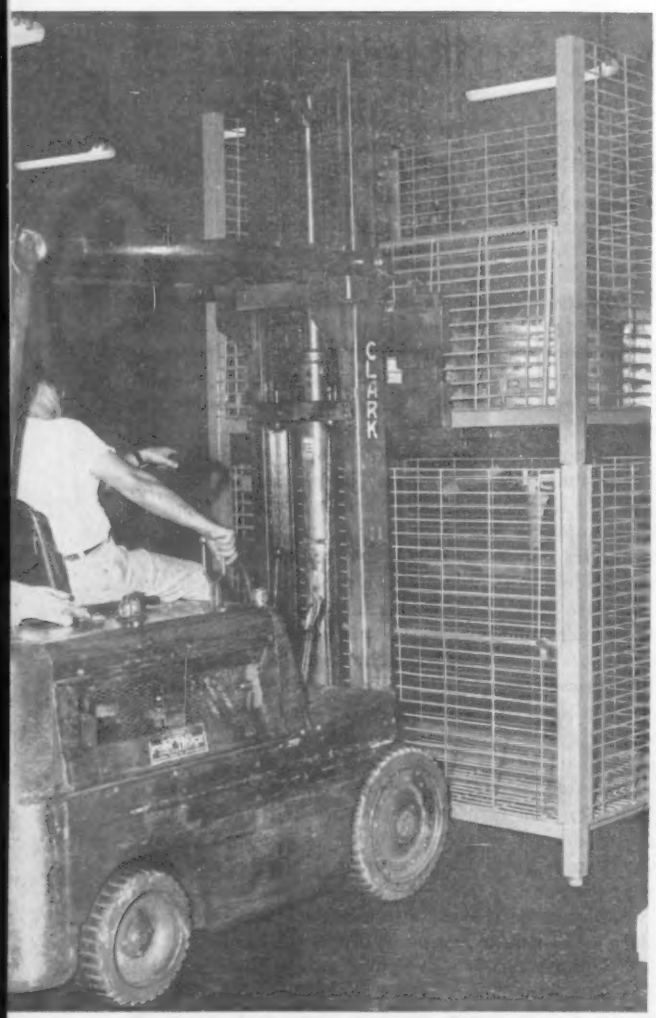
These 10 Principles

By Edward L. Beers
Delco Appliance Division
General Motors Corp.

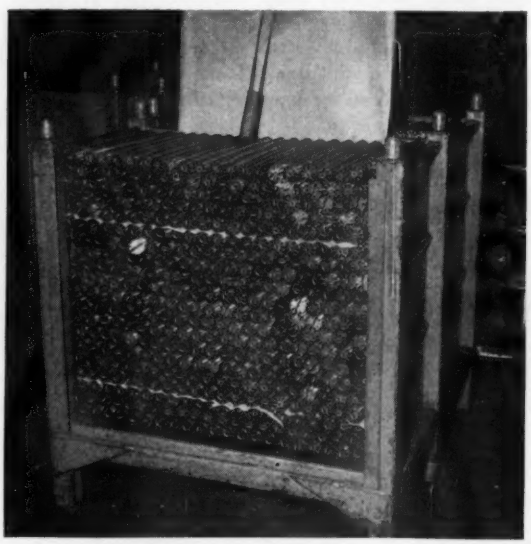
IN THE GROWING COMPLEXITY of modern technology, engineering discipline needs to be applied to every conceivable area in order to achieve cost reduction and utmost efficiency. This includes material handling. Through the application of basic material handling principles, Delco Appliance Division has succeeded in improving the containerized handling of armature and core laminations for the high-volume production of small fractional horsepower motors used in a number of automotive applications.

A study of several examples at Delco Appliance will show how 10 basic material handling principles were applied to container problems. These examples related to material handling problems are classified into four general groups: (a) containers for handling motor laminations, (b) containers for handling incoming materials, (c) economics of containers and (d) follow-up.

Containers for Handling Motor Laminations. New containers and handling methods developed for handling motor laminations were based on the following two basic principles:



WIRE CONTAINERS which were adopted to handle furnace domes are stacked to conserve storage space.



STACKING RACKS handle heater motor armature laminations. Stacks of laminations are held by spindles.

Make Good Container Design

1. *Containers must provide necessary enclosure to retain the product properly and restrain its movement to the degree necessary for protection, handling and storage.*

2. *Whenever possible, containers should be standardized.*

A study of the former method of handling laminations indicated that the essential problems to be solved were: (a) reduction of container inventory, (b) improvement of stacking or storage and (c) improved protection of parts while in containers.

Different Laminations Involved

Three types of laminations were handled: heater motor armature laminations, heater motor field laminations and split-phase rotor laminations. An inventory of 2500 pans and boxes, 100 skids, 20 trucks and 300 intermediate pallets was required formerly to handle these laminations, and no provision was included for stacking of unit loads. The number of daily moves required for various containers was estimated at 3100, exclusive of moves in a machine cycle. A substantial number of these moves involved the handling of wooden boxes and pans, both full and empty.

At the outset, it was apparent that special containers would be needed. The problem affected two major products (automotive heater motors and split-phase motors for various appliances) and, therefore, the ultimate design had to be a container that would blend into the existing standard container system. This system was composed basically of the steel tub, the collapsible wire container, two standard types of tote pans and a tubular steel coil rack.

At this point, a container choice had to be made, guided by the application of the two aforementioned principles. The need for container standardization and the storage and handling conditions of the work area all pointed to the desirability of an enclosed container accessible on one side, having one-half the capacity of the steel tub.

The result was a new lamination rack built to the same perimeter dimensions as the existing steel coil racks—33 by 19 inches—consisting of a bottom and

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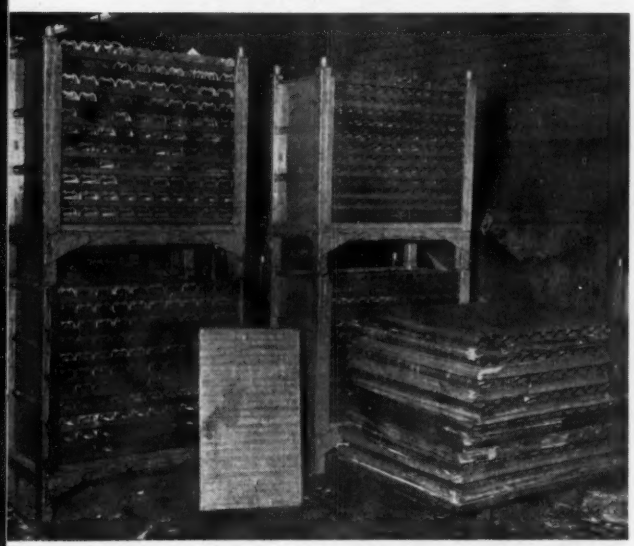
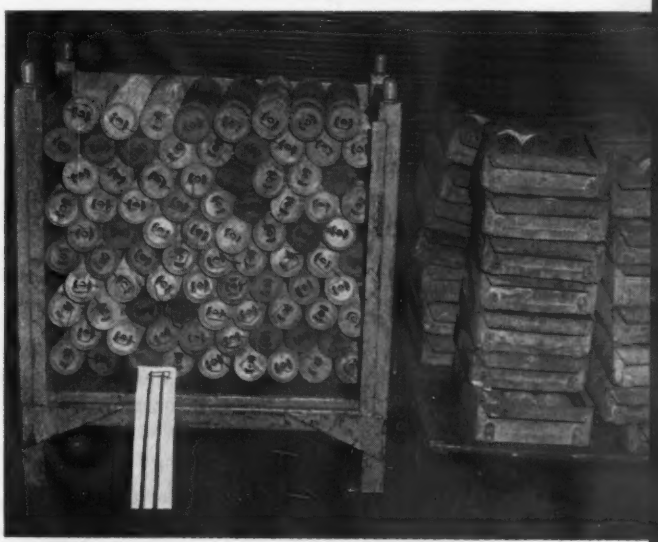


RE-DESIGNED TRAYS to handle heater motor field laminations fit racks, thus utilizing stacking feature.



SPECIAL RACKS are loaded with split-phase rotor laminations, compared with former skid and pan method.

CONTAINER DESIGN

Continued

three sides. This container had a unit load capacity of 5000 pounds and could be moved by all types of existing plant handling equipment. In addition, it could be stacked interchangeably wth the coil racks.

Another element of the basic principles to be considered was that of part protection. In the former system, pans had been used as containers which served also to retain the laminations on the spindles. The proposed rack design, however, did not utilize pans; thus, the spindles were studied for a new method of retaining the laminations. The solution was to insert spindles into both ends of the 18-inch-long stacks of armature laminations.

The use of a tray for handling field laminations was continued, since this proved basically effective because of the design of these laminations. The tray was merely redesigned to fit the racks.

In the case of split-phase rotor laminations, the retaining feature was accomplished by wire pins which were inserted into transverse holes drilled in the ends of the U-shaped spindles. Fortunately, inserting these pins did not necessarily mean increasing the production cycle time, as this operation took advantage of operator idle time within the machine cycle. These pins were handled in a dead soft condition.

Benefits of New Methods

A comparison between the old and new methods of handling laminations may be summarized as follows:

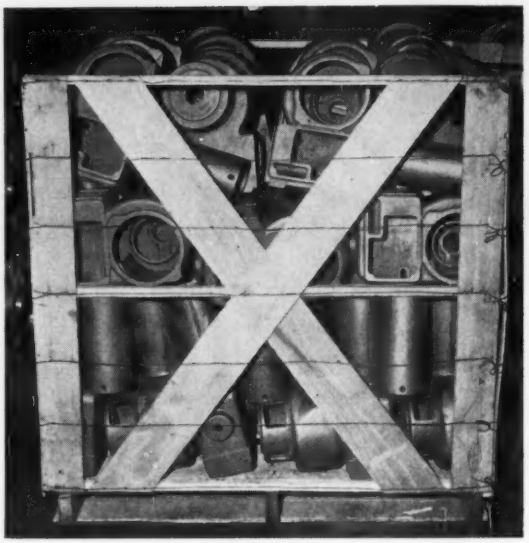
a. A reduction in the container inventory from approximately 2900 pans to 120 racks was realized. In terms of daily moves, this meant a reduction from 3100 to 1780 items.
b. A 950 percent increase in the capacity to store armature laminations was achieved.
c. A 350 percent increase in the capacity to store split-phase rotor and heater motor field laminations was achieved.
d. A positive system of handling from the standpoint of part damage and safety was instituted.

The results achieved in these examples illustrate that, no matter how difficult a material handling problem may seem in the beginning, it is imperative that the ultimate design or system be developed around sound principles. Should the basic principles be scrapped in order to ease the design problem, the result often may lead to an unsound and uneconomical system.

Containers for Handling Incoming Materials. Four additional principles of material handling were applied to a number of problems affecting incoming materials at Delco Appliance. These principles were:

3. *Containers should be designed for shipping and storage as well as for use at the point of use.*

4. *Containers should be designed of such size and construction as to permit their use in either rail car or highway truck and to make the most efficient use of floor space in either.*



EXPENDABLE CONTAINER for castings was developed through the application of basic handling principles.

5. *Expendable containers eliminate the cost of return and maintenance of returnable containers.*

6. *The weight of the container will determine how far it can be economically shipped and returned.*

The various problems occurring with incoming materials could be classified as follows:

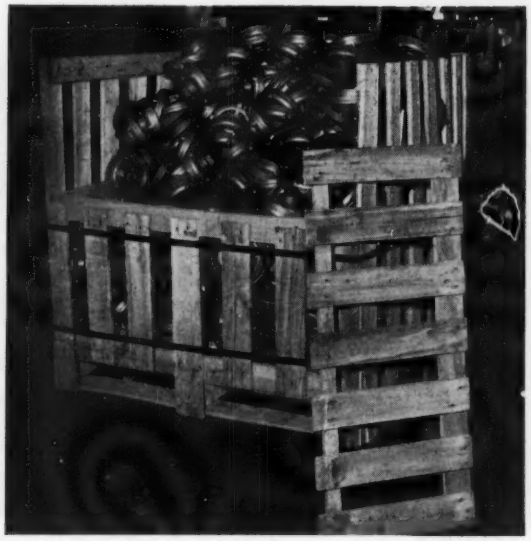
a. Periodic container shortages, brought on by inventory fluctuations.
b. Excessive handling devoted to receiving materials.
c. Ineffective utilization of cubic capacity in raw material stores.
d. Excessive scrap losses.
e. Safety hazards and poor housekeeping conditions.

To illustrate how these problems were solved, the handling of various types of castings will serve as an example, although the same problems applied generally to other incoming materials as well. The castings were of three types: (a) oil burner housings, (b) split-phase motor end bearings and (c) miscellaneous castings.

Castings for domestic oil burner housings are relatively large and bulky and these were received loose under the former handling methods from at least three different suppliers. The castings were loaded into steel tubs 42 by 36 by 24 inches, which provided a capacity for only 25 to 30 castings per tub.

Thus, when a volume shipment of castings was received, it was sometimes difficult to avoid a number of problems which included: (a) time consumed in locating a large number of tubs, (b) tying up the plant supply of tubs and (c) storing of loose castings on the floor if tubs were not available, thus introducing additional problems of storage space, casting breakage and plant housekeeping.

The castings for split-phase motor end bearings are 6 inches in diameter and in the former system were



RE-USABLE CRATE for receiving other castings is rugged, has drop-side feature and holds 2000 pounds.

STACKING WIRE container has greater capacity and drop-side gives increased accessibility at work place.

received in a collapsible wire container 46 by 36 by 24 inches, having a capacity of approximately 350 pieces. The containers, each weighing 145 pounds, were furnished by Delco Appliance to the supplier. While this system had merit as a handling method, the problems of shipping expense covering empty containers to the supplier and repairs to the containers suggested that further improvements could be made.

The miscellaneous group of castings discussed in this example consists of a variety of types, received usually in small volumes. These castings were received from as many as 10 different suppliers and were received loose or in burlap sacks, crates or 55-gallon drums. In the handling of these castings, it was seen that improvements could be made to solve the problems affecting: (a) tub supply (where required), (b) different types of containers mixed into the plant system and (c) the best use of available cubic storage space.

How Solutions Were Achieved

On the surface, an easy solution to the problem of handling these incoming castings appears to lie in the purchase of more tubs and wire containers. This action would be impractical, however, not only because of the cost of additional tubs and containers, but also because the basic material handling principles still would not be satisfied.

The solutions to the various problems described were found instead by studying and applying the four material handling principles affecting incoming materials, as listed earlier in this discussion.

In the case of handling oil burner housings—which continue to be received from at least three suppliers—an expendable, wirebound wooden crate was developed which satisfied the requirements of a container suitable for shipping, storage and use in the plant and was adaptable to either rail or truck shipment. Although the prorated cost per piece seemed relatively high, it was offset by the saving in prorated scrap and handling costs of the former method. In addition, the new container made shipment by rail possible, which resulted in further cost reduction and also allowed the plant receiving department to unload during that part of the day when incoming truck shipments were at a minimum.

Solving the problem of handling castings for motor end bearings required a cost comparison of the methods using the returnable wire container and the expendable wooden crate. The results showed that the monthly returnable freight costs of the wire containers would offset the monthly costs of expendable crates. Also, certain additional advantages would result:

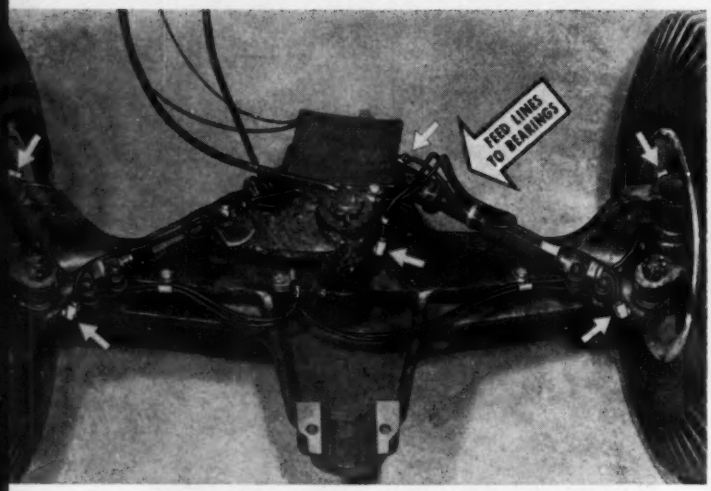
a. The system could be geared to production releases and the cost incorporated into the product since the crates would be furnished by the supplier.

b. About one-half of the crates could be reused, since they could be built of rugged construction to carry a load of 2000 pounds and also to stack in tiers. By designing the crates so that steel strapping was the sole means of holding the crates together, they could be knocked down and reused by local suppliers.

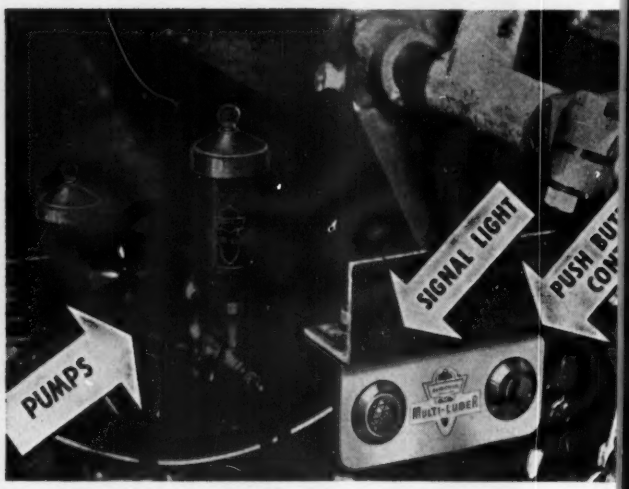
c. In some cases, the service could be carried out on a "no charge" basis where a supplier might use salvageable crates and use his own trucks for delivery. This practice could offset those cases where prorating the crate costs over a number of pieces per crate would be uneconomical due to high crate costs as a result of small orders.

During the design of both crates, it was important

(Continued on page 126)



ON STEERING AXLE assembly, fabric-insulated, Nylon feed lines teminate in adapter couplings threaded into bearing ports for positive leakproof connection.



CONTROL PANEL (for dashboard mounting) with push button and green light signal which illuminates to indicate that the lubrication cycle has been completed.

How Significant Savings Are Made As Push-Buttons on Industrial Trucks Provide . . . .

LUBRICATION ON-THE-RUN

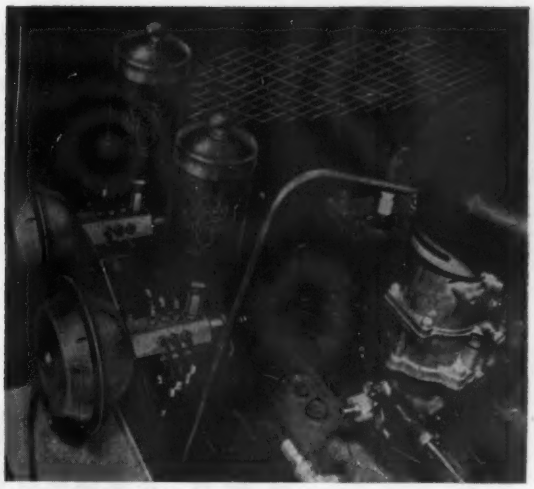
RAPIDLY increasing development in the mechanization of material handling have made obsolete methods which rely on the human element for the lubrication maintenance of machine and equipment units.

Industry has available the finest lubricants in the world—and the finest machines yet developed. Still "down-time" for maintenance continues to soar in cost; it is becoming an increasingly intolerable condition. Mechanical failures and lost production hours must be minimized through effective *automatic control* of that most important maintenance function—*lubricant application.*

A new and highly significant trend in this direction centers around the push-button, automatic, centralized lubrication system for industrial trucks. Such a system is now being offered as an optional, factory-installed service accessory by six lift truck builders.

Lubrication of industrial trucks by the conventional grease gun method has always been a tedious, time-consuming practice, requiring an average of 45 minutes or more on the part of a maintenance crew. A hoist or power lift has to be used, and, of course, the truck is out of productive use during this operation. The time interval required is extended even more for lubrication of electric trucks because, in this case, the batteries frequently have to be removed and the maintenance man has to crawl into the battery compartment to contact some of the grease fittings.

By L. C. Rotter, Chief Engineer
Lincoln Engineering Co.
Division of
The McNeil Machine & Engineering Co.



VACUUM-OPERATED PUMPS with clear plastic lubricant reservoirs for quick visibility, provide five ounce capacity—enough for 175 complete lubrications.

When one considers that an industrial truck must be lubricated at intervals of from once a day to every three days—depending on operating conditions and extent of use—it only takes simple arithmetic to compute the astounding cost in man-hours, materials and down-time expended during a year, multiplied by the number of trucks employed. As a result, high pressure lubrication systems that lubricate all bearings in two seconds—with a mere press of a button, once a day, by the truck operator—comprise a most welcome solution to a tough and expensive problem.

One such system, called "Multi-Luber", was developed several years ago. It has been an optional factory-installed accessory on Lincoln and Mercury automobiles for the past three years, as well as on six major lines of truck-trailer manufacturers and on numerous machines produced by builders of automated and conventional production machinery. Only the application to industrial trucks is new.

The primary operating characteristics of this system follow:

1. It derives its power supply from the engine intake manifold. The system is actuated by pressing a button on the truck panel. A green signal light illuminates in seconds to indicate completion of the lubrication cycle.

2. Twin lubrication pumps are mounted out of sight in the engine compartment. Tough, resilient Nylon tubing, fabric insulated, is used for lubricant feed lines extending from outlet ports in pumps to each individual bearing served by the system.

3. Lubricant reservoir capacity is sufficient to provide more than 150 cycles of the system without refilling. Transparent reservoirs on the pumps makes it easy to check lubricant level at a glance.

4. Loosely fit bearings will not take all the lubricant, thus starving the more tightly fit bearings. Every bearing served by the system automatically receives an equal, measured quantity of lubricant each time the system is cycled.

5. The reservoirs will not drain dry if a feed line is accidently broken or disconnected. All other bearings will continue to be lubricated normally.

In the case of electrically powered trucks, a manually actuated pumping unit is utilized. One push of a plunger rod cycles the system.

With respect to the advantages derived from push-button lubrication, users have reported that service-life of trucks is extended from 15 to 20 percent, and the following six benefits are further provided by the systems:

1. Apply the right lubricant, in the right quantity, at the right time to all bearing points, simultaneously, while the truck is in operation.

2. Eliminate waste and mess—cut lubricant consumption up to 50 percent or more.

3. Save man-hours—one man does a complete lubrication job at the push of a button.

4. Extend bearing-life up to 1500 percent through controlled application of bearing lubricant.

5. Eliminate down-time for lubrication, and for repairs due to bearing failure or faulty operation of worn parts resulting from inadequate lubrication.

6. Eliminate the possibility of personal injuries and corresponding compensation costs attributable to lubricant application.

Bearing Failures From Cumulative Wear

Bearing failure, due to improper lubrication—which is either application of insufficient, excessive or contaminated lubricant—results from slow, cumulative wear. The process can neither be readily detected from observation nor controlled by an exacting choice of lubricant.

In contrast with the three-fold cost of the grease gun and oil can, the centralized system involves just one cost. The initial cost is the total cost. There can be no cost in carrying it around as it is permanently installed. The manner in which it is used eliminates conditions that create premature wear.

When one stops to consider that the average fork lift truck costs as much or more than a luxury automobile, it's just common sense to take care of it. Therefore, sound, modern lubrication practices can pay high dividends.

If what you want to move is too bulky to carry in one armload . . . if it's not too heavy to put on wheels and push without help . . . and if you want your wheels immediately for handling another load . . . you're involved in the area of . . .

THOSE MEDIUM-LOAD HANDLING JOBS

By Joseph Salette, Jr.
Material Handling Specialist,
American Pulley Company

A TREMENDOUS volume of material handled falls in the "middleweight" and "lightweight" classes. These two areas have been put in the shade by the more dramatic "heavyweight" operations involving powered, riding-type industrial trucks. Our rough estimate, gained from extensive reading in industrial publications, is that there is more than twice as much information available on power trucks than on hand trucks.

This means that a vast area of material handling has been neglected—the "middleweight" area. This article is intended to fill the data gap so long existing. (Since selection of units for the "lightweight" area is not such a tough job and since their use is fairly cut-and-dried, we will confine our attention to the "middleweight" zone.)

What is this "Middleweight" Area?

If what you want to move is too bulky to carry in one armload . . . if it is not too heavy to put on wheels and push without help . . . and if you want your wheels immediately for handling another load . . . you're in the "middleweight" area.

This is admittedly oversimplified and tells but a small part of the story. Approaching the subject in terms of equipment, we find the "middleweight" area is served by:

Portable Elevating Trucks
Manual Low-lift Trucks Handling Skids or Pallets
Jack-Lift Trucks With Semi-live Skids

What you may not immediately realize from these definitions is that you can tackle some really substantial loads and still not leave the "middleweight" field. One man with a modern, well-designed load-lift pallet or skid truck can hustle a deadweight load of three tons! Even when there's a lifting job to be done, it's no trick at all for a portable elevating truck to heft 1500 pounds as high as eight feet with no strain —and yet this, too, is only a one-man job to move as well as to lift!

Economies In This "Weight Class"

It would be interesting to know how much the neglect of this subject has contributed to misapplication. How many heavy-duty power trucks have been bought for jobs calling for portable and manual units? How many dollars have been wasted through lack of application data? Since moving materials around your plant, warehouse or stockroom adds nothing to their value, *whatever* you spend for this motion is expensive. The trick, then, is to spend as little as possible *overall* and still do the job right. Here is where "middleweight" moving really becomes attractive to the economy-minded industrialist.

If your load can be moved manually you can put dollars in your pocket in many ways. For example:

First Cost: You'll initially spend only from 10% to 25% of the cost of motorized units. This tremendous cost saving has no relation to quality, for reputable manufacturers are turning out the finest products

at surprisingly low prices. The lower price of portable and manual equipment simply reflects the proper application of unit to job.

Operating Cost: With hand units there's no fuel to buy, no periodic engine overhaul, and only negligible maintenance. But be sure you choose a truck that's easy to handle, for a tired operator is an expensive one.

Space Cost: Smaller hand units need no special garage and they get around in so little room that you may even be able to reduce waste aisle space.

Building Cost: The lighter weight of hand units means an appreciable reduction in floor load and that your existing floors won't have to take anything like the punishment a heavy motorized truck inflicts.

Safety Cost: With hand units there are no exhaust fumes or fire hazard, no costly operator training needed.

To realize such savings we suggest that you review your material handling set-up to see where portable and manual equipment can save you money, how it can reduce the costly load on your more expensive motorized units, and what specific units are recommended for your "middleweight" operations.

To help you do this we shall discuss in detail the three types of units serving the "middleweight" area—their applications, mechanical features, and operation.

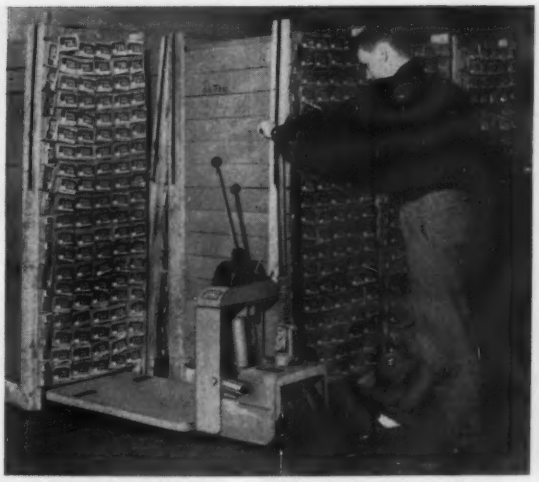
The Portable Elevating Truck

Getting down to cases, let's assume you have a job involving loads under 1500 pounds, and that this material is to be placed at some height off the floor. Basically, this is an ideal application for the portable elevating truck. But you'll need to define the job further, in terms of:

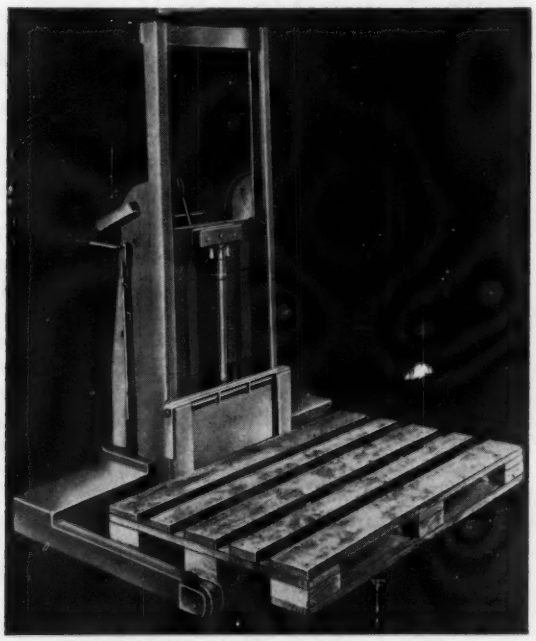
a. The maximum weight of the load to be handled;
b. Who is going to operate the truck;
c. The height to which the load must be raised;
d. Whether the load is bagged, drummed, loose or what-have-you; and
e. The amount of material to be moved in a day.

The weight of the load will fix the type of lifting mechanism you'll need. If 1000 pounds or less, a manually operated model will fill the bill—while the

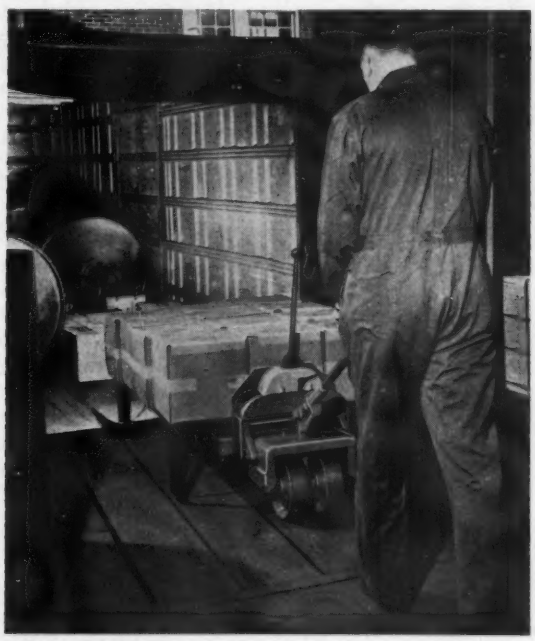
(More on next page)



LOADS TO 6000 pounds can easily be handled at floor level by manually operated low-lift truck.



STRADDLE MODELS of fork lifts, with extension arms to clear pallet sides, work in very narrow areas.



SKID TRUCK is indicated when service requires durable, strong skid, bin or other type of load carrier.

ELEVATING TRUCK is used, with little effort, to move unitized loads between depts., or as a . . .

WORK-LEVEL FEEDER, either in stacking heavy materials or in supply and removal of materials at machines, and it can be adopted as a . . .

STANDARD DEVICE to handle standardized containers of plant or department. This equipment works very economically over short distances.

electrically powered job is a must if your load will reach 1500 pounds. If a woman is to operate the lift you'll want the electrical model regardless of loading. Incidentally, manufacturers usually build a 10 percent overload capacity into these trucks, permitting occasional loading above these limits. Constant overloading, however, is not advised.

As far as lift goes, the basic dimension is truck tailgate height, which runs about 44 inches. So, if your operation includes loading or unloading trucks, you'll want a minimum lift of 46 inches. Above that, you can get lift heights up to about 96 inches, in steps of 12 inches. (*Note*: In the case of drum stackers, the drums are grabbed a short distance above the bottom. Therefore, you'd better add 12 inches when you specify the lift height you want.)

What Makes a Good Elevating Truck?

There are four basic truck types for handling various materials: fork, platform, straddle models for use with pallets, and drum-stackers. A well-designed fork lift can have a platform slipped on the forks and locked into place, making the two trucks interchangeable. Straddle models simply have the extension arms from the base spaced to clear the pallet sides. Drum-stackers are designed to handle single drums, as opposed to palletized drums, and the best models are built to securely hold all standard sizes.

The number of trucks you'll need is, obviously, a function of the anticipated volume of material per day, and the speed at which the truck can be operated. Your supplier can help with this problem. Look out for claims of high-lift speeds, though, as you don't want to endanger either the load or the operator.

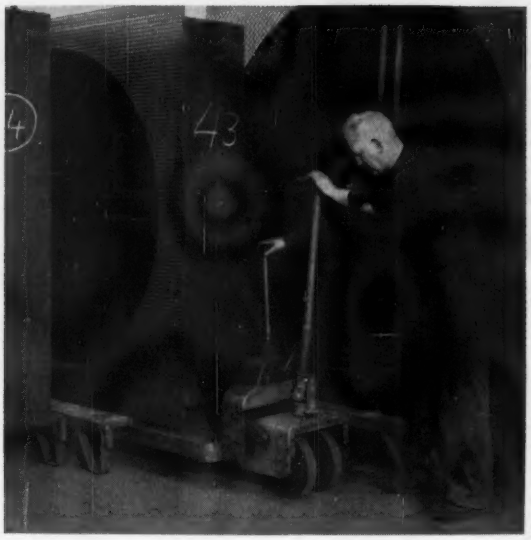
Now that you know the best type truck for your operation, let's take a good look at the most important mechanical features of a well designed truck. We'll start with the wheels. You'll want a truck that is easily pushed, one that gets around handily. A good design to achieve this will have minimum 5 inch x 2 inch swivel castors for the rear wheels, under the base. They'll be double-ball-race with pressed steel frames, and will have bearing surfaces fully hardened for long wear and curved to provide good contact with the balls. The front wheels, under the load, will be of as large a diameter as possible, consistent with the operation. If it's a drum-stacker, it may have 6 inch x 2 inch wheels here.

This design of running gear will give you good maneuverability, even under full load, but don't look for it to perform miracles in overcoming poor floor conditions. Bad cracks, small obstructions and even litter on the floor can make any truck difficult to push and steer, and can also be hard on fragile loads. Watch out for steep ramps, too, for a slope of about six degrees is the maximum a man can navigate with a fully loaded truck of any kind.

You'd better consider stability, too, while we are looking at the wheels. They should be spaced to keep the center of the load well inside them. Naturally you won't permit anyone to move a load while elevated, for any truck will tip under those conditions. But with the load down your new truck should easily make sharp turns with no unbalance.

Brakes, too, are important. Generally, wheel brakes aren't very satisfactory. Self-equalizing, dual floor brakes are the best. They should be designed to hold the truck stationary while lifting, and should check forward motion smoothly and easily while moving down a slight grade, if such is required.

The forks, which will carry your payload, should be



FOR LOW FREQUENCY moves, manual handling equipment does the job easily, safely and inexpensively.

rugged and sturdy. Have a look at them when fully loaded. They shouldn't bend down more than about 1/4 inch. They'll be tipped about one degree to the rear, to help keep the load from slipping. They'll be adjustable horizontally, but, except for unusual jobs, vertical adjustment is not needed.

Now we come to the heart of the truck, the lifting mechanism. Like a fast freight, your load needs a good roadbed and the vertical frame or mast is the track it rides. A channel section provides strength and rigidity. The rollers, which ride this channel, should fit snugly without play or wobble. None of the roller mechanism should project beyond the channel. Precision bearings must be used here, as in the wheels and castors, and they should be kept well-lubricated.

The manually-operated elevating system is simple and self-contained. The electrically run system is slightly more complicated. Any hydraulic unit should be provided with an integral relief valve, which bypasses the fluid if its pressure starts to get too high. This protects the entire system against rupture. Regardless of how it is powered, the lift action should be smooth and even, without any slipping or jerking. Leakage indicates poor design. The fluid reservoir should not spill when the truck is tipped, and there a return should be provided to collect any fluid which might seep past the fully extended ram.

With any hydraulic system, it is impossible to have both fast action and effortless lift. For safety reasons, the rate of descent of the platform should be automatically regulated to a speed of about 6 to 8 inches per second.

The available electrically operated models use either the 110-volt AC plant lighting supply, or a self-contained 12-volt storage battery. Either type is acceptable, although there is some objection to the trailing cable required by the former. Battery models may be provided with a built-in charger, which can be plugged into a 110-volt AC supply when the truck is not in use. The rate of charge should be regulated to avoid overcharge and damage to the battery. Battery rating should be at least 220 ampere-hours. In both types, any 110 volt wiring should be heavy-duty and should be stored in a coil inside the truck-case when not in use. Proper grounding is required to eliminate shock hazard.

Manual Handling of Skids or Pallets

Now let's consider the case of loads up to 6000 pounds, where the load remains at floor level. This is a job for the manually operated "low-lift" truck, or for the "jack-lift." These trucks are used to move pallets, skids, or in the latter case, "semi-live" skids. Your first step, then, is to decide which of these "bodies" is best for your moving job.

Cost is the primary consideration in choosing among pallets, skids or semi-live skids. Low initial investment definitely favors the pallet, and it will be used wherever possible, particularly when large quantities must be moved. Where the service requires a more durable all steel construction, or where a bin or other special type of carrier is called for, the skid is a better choice. Also as the load volume goes down, the cost advantage of the pallet is reduced. Almost in the lightweight class is the jack-lift and the semi-live skid, which as a rule limit themselves to part time moving.

A well qualified supplier of manual equipment can help you make your choice, since the cost figures he can provide will probably be the biggest factor you'll have to consider.

(Continued on page 112)

FLOW'S

MAINTENANCE NOTE BOOK

Planned Program for Overhead Conveyors

By P. V. Quinn
Chief Field Service Engineer
Mechanical Handling Systems, Inc.

PREVENTIVE maintenance means more today than ever before. No longer can old-fashioned "hammer-and-grease-gun" techniques suffice to keep the vital conveyor life line in maximum operating condition. In almost every field, when conveyor lines break down, material stops moving, machine tools and other productive processes stand idle, assembly lines are halted, goods remain unpacked and warehouses are unable to stock or ship. The cost of such shutdowns is quickly reflected in loss of profit to the producer.

Admittedly, planned preventive maintenance costs money. However, industry is beginning to realize that the apparent increase in maintenance costs is more than offset by the avoidance of costly shutdowns, accidents and high replacement costs.

Overhead conveyors are now used in such a variety of industrial applications and conditions that many of our remarks must necessarily be of a rather general nature. Each industry and application has its individual problems which require specific planning. There are, however, certain basic concepts which can be applied and it is these we shall discuss.

We feel that real preventive maintenance goes much further than a periodic lubrication and casual inspection program. In our opinion, an effective planned maintenance program consists of four major parts:

1. *Planned and scheduled periodic inspection by competent inspectors.*
2. *Adequate and correct lubrication programs.*
3. *Corrective adjustments and repairs.*
4. *Complete and accurate inspection and repair records.*

PLANNED PERIODIC INSPECTION

Essentially, the inspection function is designed to detect trouble before it can happen and to schedule required adjustments or repairs as quickly as they may be required without unnecessary disruption of the operation. The first requirement is that the inspectors must be thoroughly familiar with every phase of the conveyor construction and operation. They must either have assisted in the original erection of the conveyor system or else be instructed carefully and trained in the job (preferably by the manufacturer's field service organization) before being given the responsibility for maintaining it properly. All too often this is not done and the same men are assigned to the maintenance of a wide variety of machines without specific knowledge of the construction and functions of any particular one of them.

Hence, our planned preventive maintenance program begins with carefully trained personnel who have a definite understanding of mechanics and electricity, an intimate knowledge of the conveyor, its parts and functions and who are conscientious and systematic in their approach to the problem.

The next step is to plan the inspection routine. The methods may vary from a simple walking visual inspection to an actual dismantling check at certain points to determine wear. The degree of inspection will vary for individual conveyor parts and the specific conditions under which they are used. This can only be determined by a complete study of the operation, supplemented by experience. This is one of the reasons for the importance of maintaining complete and accurate records as part of the planned program.

ADEQUATE AND CORRECT LUBRICATION

It is impossible to overemphasize the importance of the correct lubrication of overhead conveyors in a truly preventive maintenance program. It is the most economical method of preventing shutdowns, excessive

INSPECTION RECORD

CONVEYOR NO. 2

STD. CHAIN PULL: 2200 LBS LOCATION: BLDG. "A" - DEPT. 9508 - ASSEMBLY DATE 12-15-56

COMPONENTS	NO.	INSP.	LUBRICATION		MECHANICAL		REMARKS
			Condition	Action Taken	Condition	Action Taken	
Conveyor Chain	4200'	J.R.C.	GOOD	NONE	GENERALLY GOOD	REP. 3 LINKS CHECK CHAIN PULL-O.K.	BOLTHEADS SHOW WEAR REP. AT JULY SHUT-DOWN
Trolleys (4")	1870	"	FAIR	LUB APPROX. 120 WHEELS	SEVERAL BAD WHEELS	REPLACED 3 BENT SIDE ARMS	UNBAL. LOAD ON CARRIERS REP. BAD WHEELS S.A.P.
15° Roller Turns	2	"	GOOD	NONE	GOOD	NONE	
45° Roller Turns	2	"	"	"	"	"	
90° Roller Turns	9	"	"	"	"	"	
180° Roller Turns	4	"	"	"	"	"	
Take-Ups	1	W.F.W.	POOR	NEEDS NEW PACK. LUB	FAIR	RELEASED ADJ. CH. WORN TRACK	INSPECT V-BLD OPPOSITE. CHECK FOR JULY OVERHAUL
Drive Motors	3	"	GOOD	NONE	GOOD	NONE	
Reducers	3	"	"	"	"	"	
Drive Chains	3	"	"	"	#1 & #3 OK #2 FAIR	"	REP. DURING JULY SHUT-DOWN
Vari-Speed Pulleys	3	"	"	"	GOOD	"	
Drive Bearings	6	"	"	"	"	"	
Cot. Attachments	3	"	"	"	"	"	
Expansion Joints	12	J.R.C.	"	REWLD. #1 & #6 OTHERS O.K.	#1 & #6 SHOW WEAR	"	CHECK FOR JULY REP.
3 HP - 1750 RPM AC Motors	1	W.F.W.	"	NONE	GOOD	"	
Safety Stops	18	J.R.C.	"	"	#15 & #3 INOPERATIVE	LOOSENED IMPROPER STOPS.	

INSPECTION RECORD is vital part of the planned program, as repairs and replacements can be scheduled before breakdowns develop and the quantity and type of parts to be needed will be known.

running wear, corrosion and replacement. Unfortunately, this subject of lubrication does not receive the attention it should in many plants.

There are too many factors involved to be able to give a simple answer to the questions, "How often should we lubricate?" or, "What lubricant is best?" Frequency of lubrication and type of lubricant to be used must be suited to the individual parts concerned, the service required of them and the conditions in which they are used. A chart should be made for each conveyor in the system and properly filled in to indicate the frequency of lubrication, quantity and type of lubricant needed for all moving parts. The charts can be modified as experience is gained in specific applications.

Types of Operating Conditions

Overhead conveyors operate through one of five conditions, or combinations of them:

1. Normal conditions: inside buildings, 50° to 100° F.
2. Outdoor conditions: outside installation, 0° to 100° F.
3. Very wet conditions: washers and spray booths, 60° to 210° F.
4. Hot dry conditions: ovens, 60° to 500° F.
5. Combined conditions: Bonderite systems, etc., variable temperatures.

Under normal operating conditions, we have found that trolley wheels should be lubricated with a high grade water repellent petroleum base grease having a range of 30° to 350° F, about every 60 days. The quantity used depends upon the size of the wheel (a 3-inch wheel requires .125 ounces, a 4-inch wheel requires .230 ounces, etc.).

Under outdoor conditions, the same type of lubricant is usually satisfactory, except that if operating conditions are very cold and the trolley wheels pull hard, a few drops of SAE-10 or SAE-20 oil should be added to each wheel occasionally to thin out the grease.

When operating through washers and spray booths, under very wet conditions, care must be taken to add grease as specific conditions may dictate in order to keep the wheel filled. If this is not done, moisture condenses inside the wheels and causes rapid corrosion and early destruction. This is also true for operations through steam chambers and similar installations.

Hot and dry conditions (through ovens, for example) present the same problems as wet conditions, and if oven temperatures are over 320° F (up to 400-425°), special lubrication with high temperature grease is required.

When conveyors operate through a combination of conditions, such as alkali wash booths, chromic sprays, Bonderite, water rinse, dry off, spray paint booths and high temperature bake ovens, a most serious lubrication problem is presented. For the wet conditions, trolley wheels should be packed full of grease, while the high temperatures call for as little grease as possible for adequate lubrication. These conditions are diametrically opposed. In addition, no oil or grease may fall on the work after cleaning because it would mar the finish.

For such conditions, the safest procedure is to fill the wheels full of high temperature grease to prevent condensation and subsequent rusting inside the wheels. New grease will have to be added at frequent intervals, and the old grease purged from the wheels. Periodically the trolleys should be removed from the line, thoroughly cleaned and the lubrication cycle resumed. The period for this has to be determined for each specific application, as it depends largely upon the oven temperature and the length of time trolley wheels operate within the oven for each complete cycle of the conveyor.

(More on next page)

FLOW'S

MAINTENANCE NOTE BOOK

An alternate method, particularly for 400° to 450° F temperatures, is to use trolley wheels without seals. In such cases, immediately after they leave the Bonderite booth, the wheels are blown out thoroughly by air nozzles to remove all moisture and are then automatically lubricated by a fog oiler, using a highly-refined polymerized oil for high temperature use. The trolleys are lubricated a second time after leaving the ovens. In these applications, trolley wheels should be well protected by baffles in the spray booths and washers. When production is stopped for any reason, the conveyor should be operated long enough so that all wheels are moisture-free and lubricated to prevent corrosion of the ball bearings and raceways during the idle period.

For very hot and dry conditions (ovens 425° to 550° F), trolley wheels without seals are frequently used, being lubricated with a fine mist of oil from a fog oiler directed toward the trolley bearings. A highly-refined polymerized oil for high temperature use is again recommended.

Sealed trolley wheels are usually factory packed with a good medium base grease (water soluble), with a rating of 1000 hours at 230° F, and about three years' operation at temperatures not exceeding 180° F. This type of wheel should never be used through washers or spray booths or where water can dissolve the lubricant, or at temperatures constantly over 120° F.

Overhead conveyor chain should be lubricated with an EP oil, such as Hypoid SAE 140, at least every 60 days in normal 8-hour operations and oftener under more severe conditions. Dry chain will wear and gall, and galling of the chain link and pin prevents the joint from straightening properly as it leaves bends and turns. This, in turn, holds the trolley twisted and causes the trolley wheel to rub hard on the web of the rail, adding considerably to the chain pull and causing excessive trolley replacement.

An automatic oil mist lubricator or spray gun should be installed immediately after the drive where the chain is slack, thus allowing the oil to reach the wear points of the chain links and pins more readily. Where oil must be used sparingly, a few drops can be applied to each chain pin by means of a hand oiler.

Other important points which must receive careful lubrication are at the horizontal turns, whether roller or traction wheel type. Rollers should be lubricated at least every 60 days with a high-grade ball bearing grease. Traction wheels are usually equipped with Timken bearings and standard force-feed grease fittings. They should be serviced at least every 60 days in normal 8-hour service. For oven use, or in temperatures up to 320° F, a high-temperature grease should be used. High temperatures, fast chain speeds, high chain pull and humidity all contribute to the necessity for closer inspection at shorter intervals between greasing.

Take-up units, expansion joints, safety stops, drive motors and chains, reducers, speed variators, etc., all require careful lubrication if they are to function properly at all times, with long life and low replacement costs.

The method of lubrication, whether by hand (paddle, brush, oiler or grease gun) or by special devices (individual, centralized, manual or automatic systems) should be selected for the part in question, general operating conditions, individual system requirements and the type of lubricant to be used. The chief consideration must be which method will yield

(Continued on page 119)

LUBRICATION CHART should be made up for each conveyor in the system and properly filled in to indicate the frequency of lubrication, quantity and type of lubricant to be applied to all moving parts.

LUBRICATION CHART

CONVEYOR NO. 2 LOCATION BLDG. "A" - DAY. & SUB-ASSBLY.

COMPONENTS	NO.	LUB. PTS.	GREASE		OIL		LUBRICATION CYCLE
			Quantity	Type	Quantity	Type	
Conveyor Chain	1870	5&10			Few Drops Per Pin	Hypoid SAE 140 E.P.	60 DAYS
Trolleys (4")	1870	1870	0.05 oz. ea.	Hi-Temp "D"			" "
15° Roller Turns	2	8	0.01 oz. Ea.	Ball Bear'g #10			" "
45° Roller Turns	2	12	"	"			" "
90° Roller Turns	9	72	"	"			" "
180° Roller Turns	4	64	"	"			" "
Take-Ups	1	18	"	"			" "
Drive Motors	3	6	Use Manufacturer's		Recommendations		" "
Reducers	3	9	"	"		"	" "
Drive Chains	3	3			Light Application	SAE 30	Brush Weekly
Vari-Speed Pulleys	3	6	0.01 oz. Ea.	Ball Bear'g #2 (Light)			30 DAYS
Drive Bearings	6	6	0.01 oz. Ea.	Ball Bear'g #10			60 "
Cat. Attachments	3	60			Few Drops	Hypoid SAE 140 E.P.	" "
Expansion Joints	12	12			Few Drops	Hypoid SAE 140 E.P.	In Oven - 30 Days Outside - 60 "
3 HP - 1750 RPM AC Motors	1	3	Use Manufacturer's Recommendations				
Safety Stops	18	36			Few Drops	SAE 30	60 DAYS

HOW CLOSE is the "AUTOMATIC WAREHOUSE?"

■ IS IT FEASIBLE?

"For many companies . . . completely automatic receiving, stocking, order picking, grading, flow control, order consolidating, packing, sealing and dispatching to carriers are entirely feasible even now."

■ IS IT PRACTICAL?

"Economic analysis frequently shows that what appears, superficially, to involve excessively high capital cost becomes an imperative investment when equated against the savings potential."

By Allen Harvey, I. D. Robbins and Sol Tanne
of Dasol Corporation
Members of the New York Chapter, AMHS

CONVEYORIZING has been the accepted method of moving goods continuously from one fixed location to another. The powered lift truck has provided the means for handling goods in larger modules, moving them from place to place as required without necessarily having a fixed pattern.

But if the conveyor—or conveyor-related equipment—could be made more versatile, if it could receive and discharge automatically, if it could perform its duties in response to demand, if some process—sorting, for example—were taking place while the goods were moving, then the whole field of material handling could "take off". Engineers could let their imaginations roam, secure in the knowledge that whatever is the most logical way to do the job is within the realm of practicality.

For many companies above a minimum size, and in certain industries, completely automatic receiving, stocking, order picking, grading, flow control, order consolidating, packing, sealing and dispatching to carriers are entirely feasible even now. For others, the use of automatic systems awaits only the development of mechanical components.

The essential change that has taken place in the

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• This is one of the award-winning papers in the Fourth Annual Clark Award Contest. The Contest is conducted annually by the Honors & Awards Committee of the AMHS.

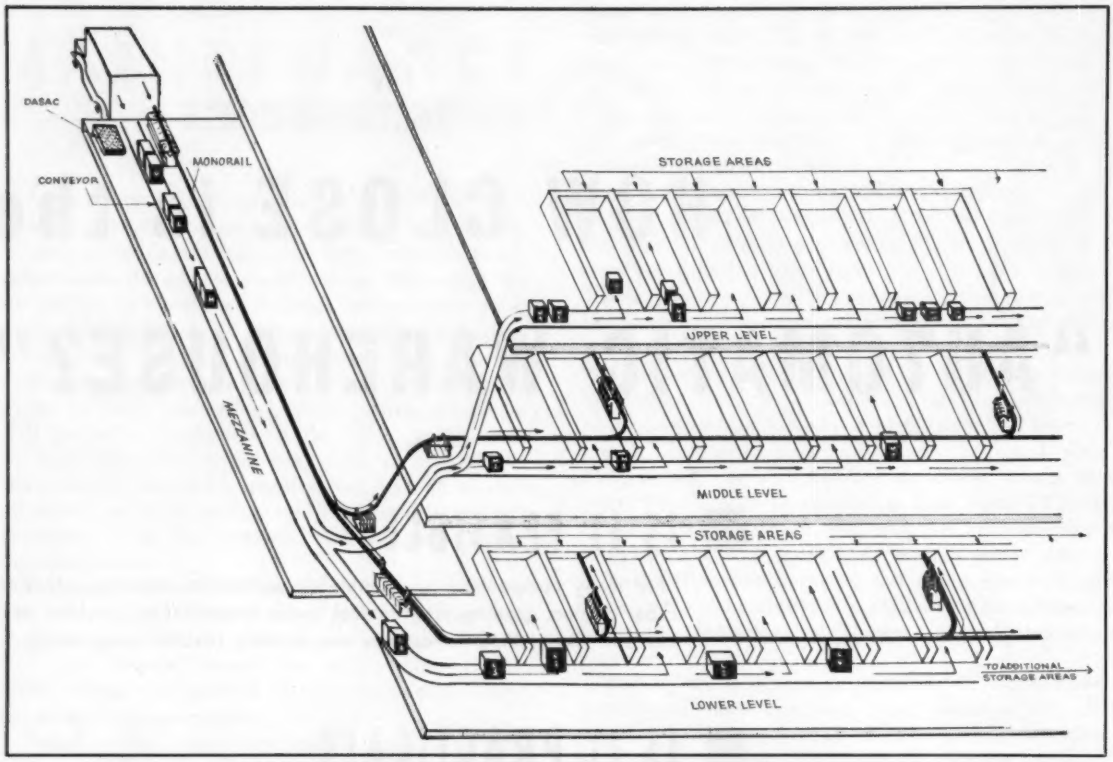


FIG. 1: MECHANIZED RECEIVING includes conveyorization and live storage of unit loads.

Automatic Warehousing: Is It FEASIBLE?

material handling picture is the reality today of control equipment capable of accepting and, if necessary, of "memorizing" instructions and making "decisions" and then transmitting the proper impulses to mechanical equipment, as required. Such controls are not laboratory curiosities but are embodied in rugged equipment standing up to daily production tasks.

It can be demonstrated that so-called automated material handling is entirely feasible for many companies and under many different conditions. It is still a problem to recognize where such possibilities exist, to encourage the application of automatic handling where it logically fits in, and to obtain the correct mechanical components.

In the layman's terms, warehousing consists of four principal operations: receiving, storage, order picking and consolidation, and dispatching. Within these four principal operations, a number of activities may take place—including sorting of various kinds, packing and sealing, routing, loading, etc. Variations also occur as a result of the different kinds, numbers, weights, sizes and consistencies of the products which must be handled, and because of routines which must be set up to comply with a required way of doing business.

From a description of the principles of automatic warehousing and some of the ways in which they can be applied, the opportunities for applying them in all fields can be recognized. Variations from one field to another will consist of providing the combination of mechanical equipment—such as conveyors, hoists, racks, chutes, carriers, etc.—plus controls required in the performance of a given task. To fulfill the basic functions in warehousing requires, essentially, two types of control equipment. Both of these have been fully developed, but as yet they have not been widely used. One of these types provides for the automatic sorting of material; the other for the automatic selection and discharge of material. Variations of these two basic controls can be developed to meet any specific situation.

A sorting system is needed so that material can be automatically directed to get off or on conveyors. This permits either the automatic storing of material in live form or the automatic sending of it to any predeter-

(More on page 76)

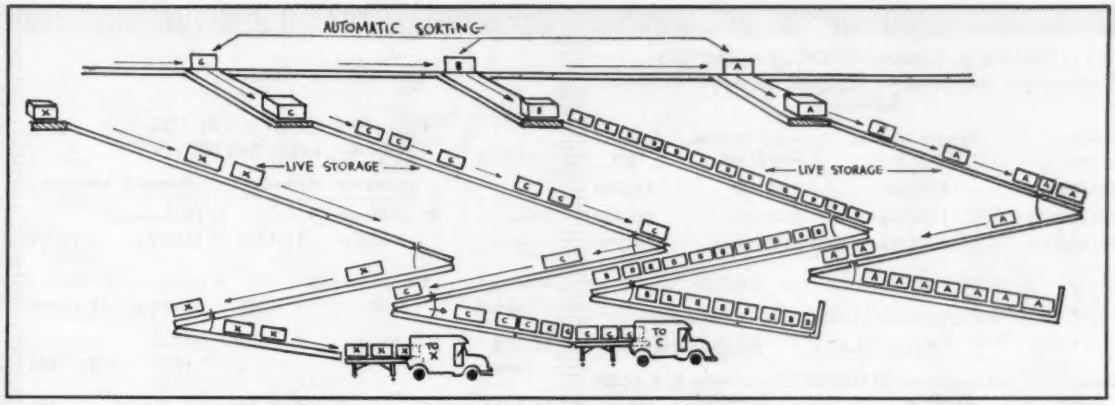


FIG. 2: NO WORKERS are required to handle materials sorted and picked automatically.

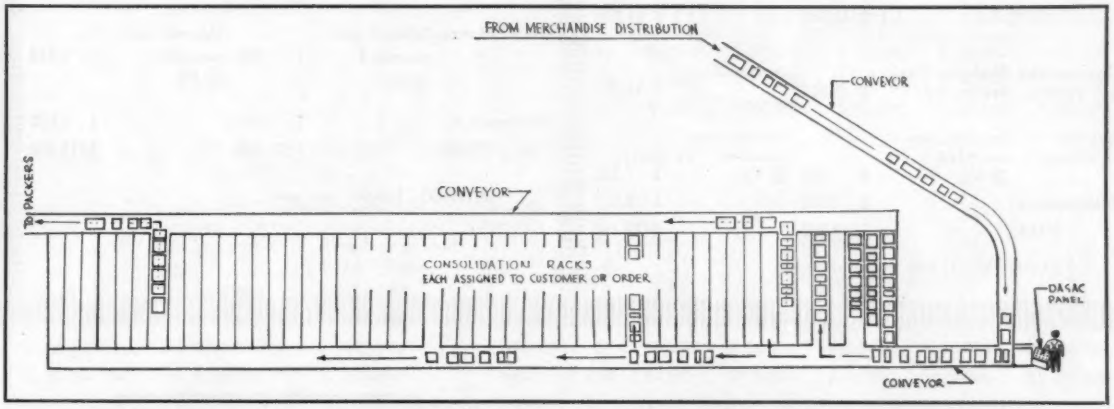


FIG. 3: CONTROLS and related equipment provide for accumulation and consolidation of orders.

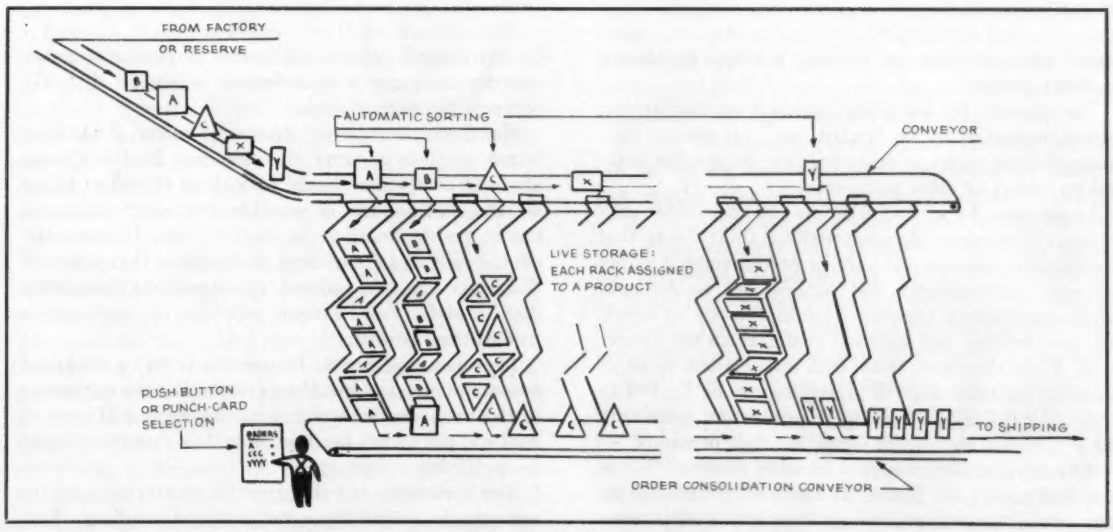


FIG. 4: SORTING SYSTEM automatically holds shipments for dispatching to carriers.

FIGURE 5: SUMMARY COST ANALYSIS
Comparison of present Method Cost to Proposed Methods

Volume Level	Present Method Cost/Year	Proposed Method Cost/Year	Savings/ Year
$30,000,000	$150,300	$122,750	$27,550
$40,000,000	$196,300	$135,350	$63,000
$50,000,000	$242,300	$158,050	$84,250

COST ANALYSIS—VOLUME LEVEL: $30,000,000

	Present Methods		Proposed Methods	
Direct Labor:	52 employees @ $2500/yr	$130,000	27 employees @ $2500/yr	$ 67,500
Indirect Labor:	5 employees @ $2500/yr	$ 12,500	5 employees @ $2500/yr	$ 12,500
Light & Power:				$ 800
Materials:		$ 4,000		$ 500
SUB-TOTAL		$146,500		$ 81,300
Depreciation (10 years):	Shelving, Conveyors, etc.	$ 3,000	Automation	$ 31,600
Use of Money:	Interest compounded @ 4%	$ 700	Interest compounded @ 4%	$ 7,350
Maintenance:		$ 100		$ 2,500
TOTAL		$150,300		$122,750

SAVINGS: $27,550 per year

FIGURE 6: COST ANALYSIS
VOLUME LEVEL: $40,000,000

	Present Methods		Proposed Methods	
Direct Labor:	70 employees @ $2500/yr	$175,000	32 employes @ $2500/yr	$ 80,000
Indirect Labor:	5 employees @ $2500/yr	$ 12,500	5 employees @ $2500/yr	$ 12,500
Light & Power:				$ 800
Materials:		$ 5,000		$ 600
SUB-TOTAL		$192,500		$ 93,900
Depreciation (10 years):	Shelving, Conveyors, etc.	$ 3,000	Automation	$ 31,600
Use of Money:	Interest compounded @ 4%	$ 700	Interest compounded @ 4%	$ 7,350
Maintenance:		$ 100		$ 2,500
TOTAL		$196,300		$135,350

SAVINGS: $63,000 per year

Automatic Warehousing: Is It PRACTICAL?

mined place, whether for picking, grading, packaging or other process.

The controls for automatic selection or discharging permit materials to be "called out" of storage, discharged from racks or other holding devices for making up orders or other purposes.

These two basic controls can be provided with "memory" or even "decision making ability"—so that systems can operate not only in predetermined cycles but also intermittently and in response to demand, either maintaining constant inventory levels or selecting and feeding the required material at the proper time. While this essay deals with applications to warehousing, the same control principles can be applied to material handling or feeding in production tasks with the production equipment supplying the "demands."

All control concepts employ existing electronic tubes, punched tape, push button or other informational input system, timers, switches, relays and similar components. The achievement of a specific performance by any control system is a matter of putting together existing components in a pattern or circuit that will perform the desired tasks.

Manifestly, completely unmanned material handling is not possible in every situation but, by 1966, thousands of companies should be making the effort to get as close to this ideal as possible. For most companies the economic question is the key one. If industrial engineering and accounting studies show that sufficient dollar savings are available from operating economies, then specific development projects or applications studies are justified.

It probably will never be possible to buy a packaged automatic material handling system. But the variations in the problems with which management will have to deal will not be too much greater than those now faced in specifying conveyors.

The accompanying diagrams illustrate some of the activities in warehousing and material handling which may be performed automatically. Note that each dia-

FIGURE 7: COST ANALYSIS VOLUME LEVEL: $50,000,000

	Present Methods		Proposed Methods	
Direct Labor:	86 employees @ $2500/yr	$215,000	39 employees @ $2500/yr	$ 97,500
Indirect Labor:	7 employees @ $2500/yr	$ 17,500	7 employees @ $2500/yr	$ 17,500
Light & Power:				$ 800
Materials:		$ 6,000		$ 800
SUB-TOTAL		$238,500		$116,600
Depreciation (10 years):	Shelving, Conveyors, etc. $ 30,000	$ 3,000	Automation	$ 31,600
Use of Money:	Interest compounded @ 4%	$ 700	Interest compounded @ 4%	$ 7,350
Maintenance:		$ 100		$ 2,500
TOTAL		$242,300		$158,050

SAVINGS: $84,250 per year.

FIGURE 8: EFFECT OF INCREASED WAGES ON PAYOUT TIME

Wages	Hypothetical Capital Investment in Automatic Equipment	Hypothetical annual Operating Savings over present method	Pay-Out Period
75c per hr.	$100,000	$12,500	8 years
$1.00 per hr.	$100,000	$16,000	6 years
$1.50 per hr.	$100,000	$25,000	4 years
$2.00 per hr.	$100,000	$33,332	3 years

FIGURE 9: TYPICAL EFFECT OF INCREASED SALES ON OPERATING SAVINGS AND PAYOUT TIME

Volume	Cost of Automation Equipment	Warehouse Operating Cost Old Method	Warehouse Operating Cost New Method	Operating Savings	Payout Time
$50,000,000	$500,000	$200,000	$100,000	$100,000	5 years
$60,000,000	$500,000	$240,000	$100,000	$140,000	3.57 years
$75,000,000	$500,000	$300,000	$125,000	$175,000	2.86 years

FIGURE 10:

No. of Employees	Assumed Cost per employee per year	Payroll Before Automation	Payroll After Automation	Available for Investment—3 Year Payout	Available for Investment—5 Year Payout
10	$3,000	$ 30,000	$ 15,000	$ 45,000	$ 60,000
20	$3,000	$ 60,000	$ 30,000	$ 90,000	$150,000
100	$3,000	$300,000	$150,000	$450,000	$750,000

FIGURE 11:

No. of Employees	Assumed cost per employee per year	Payroll before Automation	Payroll after Automation	Available for Investment—3 Year Payout	Available for Investment—5 Year Payout
20	$3,000	$ 60,000	$30,000	$ 90,000	$ 150,000
100	$3,000	$300,000	$75,000	$675,000	$1,125,000

gram shows the application of either sorting or discharging controls to a kind of problem which recurs constantly throughout industry.

Figure I illustrates Receiving. Here, merchandise is placed on conveyors directly from a truck. Information as to its destination and storage is punched into the control equipment. It then travels without further intervention to its proper storage area, and automatically gets off the conveyor where it is supposed to get off. At this point it is held in live storage for disposal. There is no theoretical limit to the amount of material that can be handled, the distance it can travel, or the number of automatic sorts that can be made.

Figure 2 illustrates the sorting of goods into live storage and picking of goods as required from live storage. Note that both kinds of controls, sorting and discharging, are used. No workers are required to handle the material. The length, size, construction and amount of mechanical equipment will depend on the kind or volume of material to be handled. The control equipment is the same, in principle, for any kind of material, since its task is to accept information and send the right impulse to the right equipment at the right time.

Figure 3 illustrates the use of controls and related mechanical equipment to provide for the accumulation or consolidation of orders, perhaps before packing or other further processing. Batches of one kind of goods may be distributed into the various channels representing outgoing orders, or orders may be picked separately and automatically consolidated.

Figure 4 illustrates the use of an automatic sorting system for the purpose of holding shipments for dispatching to carriers. Material may be sorted by carrier or by delivery routing for each carrier. It is then held live, in up-to-trailer-load quantities, ready for instant and automatic discharge when the carrier is ready for it. There is no manual handling before positioning in the truck. Material is kept under control at all times. Errors are reduced, and platforms remain uncluttered.

Note that, in these illustrations, the control and equipment take over the heavy, repetitive work—sorting and picking, as examples—presently performed by unskilled, or at best semi-skilled labor, requiring a minimum of judgment. Analysis of existing warehouses has shown over and over again that this class

(Continued on page 88)

Heavy-Duty Handling for High-Speed Processing

● Here's how Buckeye Cellulose Corporation is helping meet today's great demand for cellulose

TO PRODUCE a sheet of cellulose 15 feet wide and 100 miles long requires handling and processing of some 750 cords of wood. This man-sized job is done each day at Proctor & Gamble's plant at Foley, Florida. Operated as the Buckeye Cellulose Corporation, it is the parent company's largest plant and occupies 54 acres of land.

The demand for cellulose has skyrocketed more than 350 percent in the last 15 years, and it has become the basic material for rayon, plastics, photographic film, lacquers, tire cord, cellophane and writing and absorbent papers. The three grades of cellulose made in the plant are: viscose, for tire cord, textiles and cellophane; acetate, for plastics and film; paper, for quality papers.

Layout of the plant was determined largely by the power plant, which is centrally located. At one side is the wood yard, with storage and conveyors for pulp logs. The finishing processes, recovery unit and water treating plant also encircle the power plant. The warehouses and offices are located in front of the finishing processes.

The logs arrive at the yard via truck and rail flatcars. There is a steady flow of incoming pulpwood, on an around-the-clock basis, seven days a week. A reserve supply is kept in the yard to compensate for any slowdown of cutting during bad weather, and about 15,000 cords are piled in the yard at all times. Since the wood deteriorates in storage, no more than a month's supply is stored and it is removed on a first-in, first-out basis.

Handling Incoming Logs

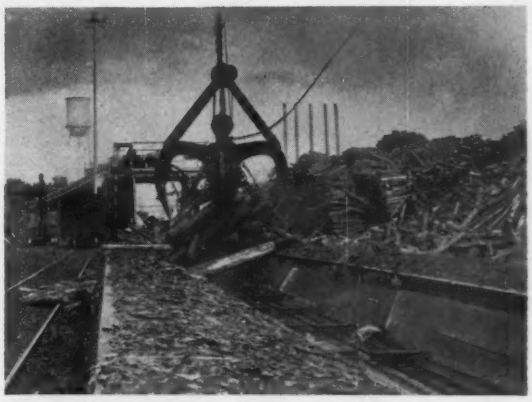
The first step in the operation is to move the pulpwood to the barking drums. Incoming logs are either unloaded directly onto a drag conveyor leading to the barking drums or placed in storage. An entire truck load of logs can be unloaded in one operation by a

CHAIN CONVEYOR carries logs from the storage area to the barking drums, first step in the operation.

power crane and sling, while rail cars are unloaded by a crawler machine equipped with a ram attachment to push the logs onto the drag conveyor. Or, if logs on rail cars are to go to storage, they are handled by the crane and sling. To load the conveyor with logs from storage, a power crane equipped with an orange-peel bucket is used.

While various methods may be used to bark logs, here they are tumbled in two drums which are 14 feet in diameter and 67½ feet long, with three internal sections. The first two sections are dry, the third wet. The bark is removed quickly and is conveyed to hogs which grind it up for use as fuel in the power plant, thus supplementing the primary fuel, oil.

After the peeled logs are spray washed, they slide down ramps to flat conveyor belts running at floor level through the sorting shed. Since the quality of the logs has a decided effect on the end product, they are carefully checked at this point. Logs not completely barked are finished by the checkers with axes. Bad spots are cleaned out. Rotton, charred or limby pieces are rejected and ground up for fuel. Oversized logs are split or quartered by a hydraulic splitter.



ORANGE-PEEL BUCKET on power crane is used to load conveyor with logs which are taken from storage.

At the end of the sorting floor, the logs fall onto a conveyor that carries them to two chipping machines. These are huge units, equipped with 12-inch knives on a frame 7 feet in diameter, and they reduce the logs

(More on next page)

to chips not more than 3/8 inch thick. The chips travel over screens which shake out oversize and undersize pieces, knots, slivers and sawdust. The waste from the chips goes the way of the other waste—it is ground up and used as fuel.

A belt conveyor then takes the chips to two large brick storage silos. While stored there awaiting further processing, their moisture content is checked several times a day and held within limits suitable for the digesting process. As needed, the chips are drawn from the silos and carried by inclined belt conveyor across the yard, past the power plant and to the top of nine digesters. The weight of the chips is recorded automatically along the way.

The Cooking Process

The digesters are four stories high and are loaded with uniform batches of chips. The chips are cooked with hot chemical reagents which are determined in the laboratory for each batch. The characteristics of the wood must be known in the chemist's language, and they are determined by exhaustive tests. Then, the "cook" is designed in detail and is performed on batches of chips.

The first cook, under pressure, is with water and acid to remove sugar. The second is with the caustic solutions designed for the batch, to remove turpentine and impurities, particularly the lignin that binds the fibers together. The make-up of the solutions determines the quality of the pulp.

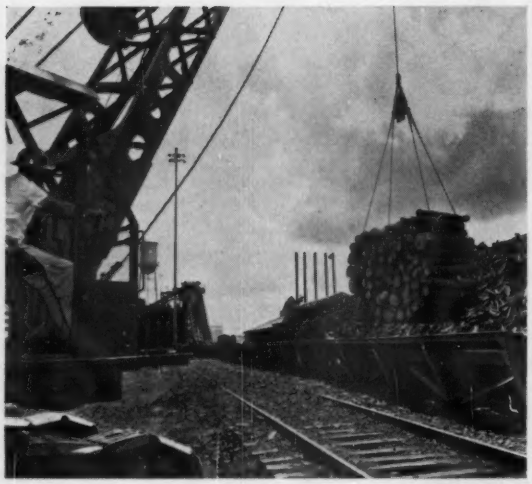
Interestingly enough, the wood used is southern pine which, because of its high pitch content, was not thought fit for conversion until about 20 years ago. Pulp was first made by grinding wood between rough stones. In time, the soda process, the sulphite process, the sulphate or kraft method and endless combinations were found to produce stronger and longer fibers from different woods. However, none of these removed the pitch in pine, and this species was therefore considered unfit.

Results of Research

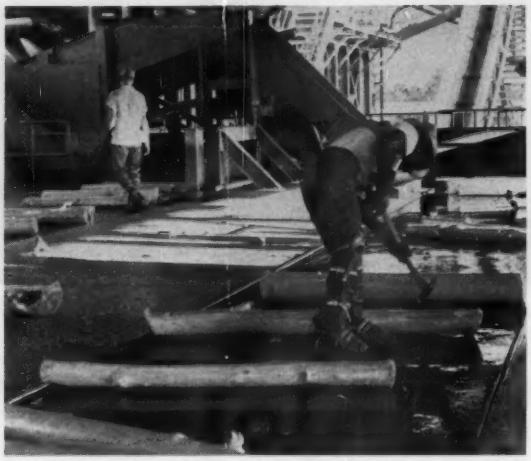
Advancing research found processes in which pine could be used. At first, the product was suitable only for brown wrapping paper and cartons. It was refined until it seemed to be a likely source of newsprint and better papers, but traces of the adhesives showed up to discolor the paper.

At the Buckeye plant, continuing research has projected beyond anything that has been done before, reaching for the highest quality that has yet been attained in cellulose. Thus, many of the processes are necessarily kept secret and little can be said about solutions, temperatures, pressures or any other factor in the conversion of chips to slurry.

After the chips have been digested, the resulting pulp is blown out of the digesters by steam and thoroughly washed and screened. It is then pumped as a



SLING carries entire truck load of logs and unloads either directly onto conveyor or adjoining stockpiles.



FLAT BELT CONVEYOR carries peeled logs to sorting shed to be closely checked and cleaned up, if needed.

CHIPS which have been screened travel to digesters via belt conveyor; weight is recorded automatically.

slurry to blend and storage chests, which are two-story brick tanks lined with non-porous and non-corrosive tile. Storage here blends the pulp and protects it from contamination.

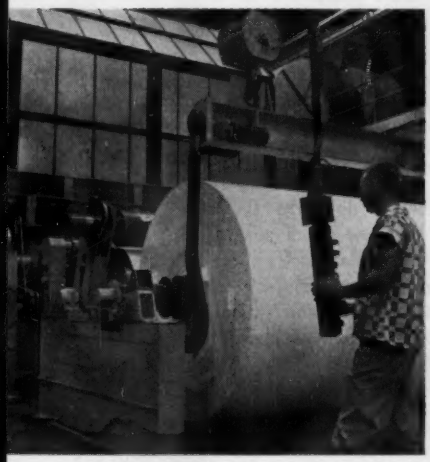
To make certain that all minerals and impurities are washed away, the Buckeye plant has its own water purification and softening plant. After the final wash, the pulp goes back to the storage chests. From these it is piped into wet cyclones that remove any remaining traces of impurity and then into refiners that break up the bundles of fiber. At this point, the pulp is ready to assume a sheet form.

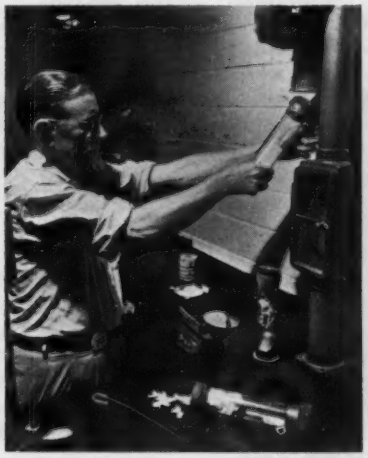
The forming operation consists of flowing the fiber, mixed with 200 times its weight of water, onto a wire-screen belt, 185 inches wide, of the Fourdrinier paper-making machine. The machine is a block long, consisting of a train of rolls with a highly complicated drive. Vacuum boxes and presses gradually remove the excess water. From the wire-screen belt, the sheet is picked up by fine felt belts, steadily consolidating and weaving its fibers together through the endless series of presses and steam drying drums. Finally, the pulp emerges as a sheet approximately .033 inches thick.

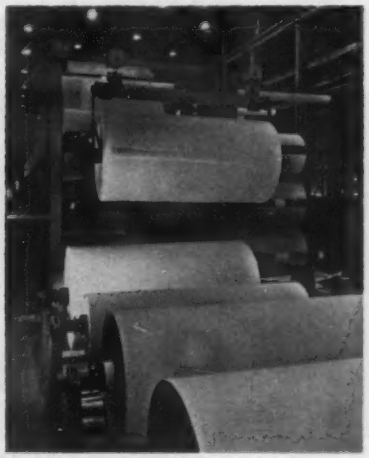
As the sheet dries, it shrinks. Consequently, the speeds of all the rolls must be geared to the shrinking of the sheet. The solution of the problem of progressively related speeds for the rolls was instrumental in perfecting the Fourdrinier machine, and in making the production of paper from coarse materials possible.

On the last spool, the sheet is 13 to 14 feet wide and weighs about 10 tons. It is picked up and carried to a temporary storage area by overhead crane. The roll is given an identifying label and final samples are sent to the laboratory. A pneumatic tube system carries samples between the various control points in the plant and the laboratory. After the laboratory approves the roll, it can be moved to other storage or prepared for marketing.

Some rolls are re-wound and split into narrower rolls to customer specifications. Others are fed into a multiple-blade cutting machine and cut into sheets which are bundled into 500-pound bales. These bales are carried by gravity roller conveyor to the wrapping counter where they are weighed, wrapped and bound with wire. They are stacked three-high by a stacker and are loaded by fork truck into trucks or rail cars.







FINISHED ROLL of pulp is placed into temporary storage by overhead crane (left) while samples are tested in laboratory and delivered by pneumatic tube (center). If OK, it goes to final storage (right).

SOME PULP is cut into sheets, baled and carried by gravity roller to be weighed, wrapped and bound.

In this warehouse, good flooring is the . . .

Foundation For Profitable

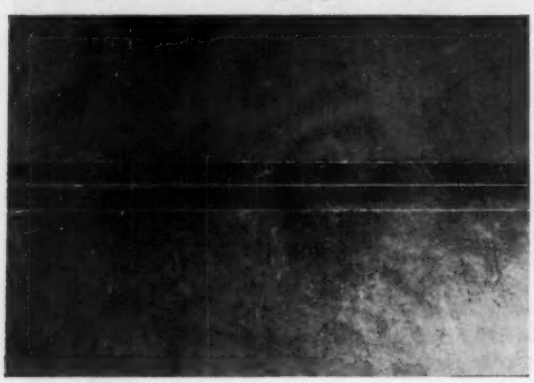
WHEN a new food distribution center was planned six years ago by First National Stores, Inc., the design of the floor was a prime consideration in the over-all material handling system.

The Portland, Maine, company had designed a warehouse with a material handling system which could move a large volume of foodstuffs at a tonnage-per-man-hour well above the national average, and the plausibility of the entire system was thought to be heavily dependent upon a floor that could withstand constant, heavy trucking without rapid deterioration.

Over 25 million pounds of foodstuffs were to be transported each month by First National Stores, by a variety of handling devices including fork trucks, castered hand and walkie trucks and 4-wheel trucks pulled by an overhead tow chain.

Company engineers looked for a flooring material that would hold up under the abusive wear. This material would have to withstand conditions that cause dusting, pitting, cracking, softening or rutting in floors of conventional materials. And it would have to be priced within the reach of an economy-minded firm in a highly competitive business.

SO SEVERE is traffic that steel contraction joints show gouges from casters of 4-wheel trucks pulled across them. Adjacent concrete flooring still shows no wear.



Engineers decided on a hard topped granolithic concrete floor with a topping put down by the absorption process.

This method, which closely controls the water-cement ratio, achieves a tight bond between topping and underslab. It also insures even distribution of the hard granitic rock aggragate throughout the mass. The resultant floor has the uniform smoothness and the extreme density to meet First National's heavy duty requirements.

The base slab was put down by the general contractor with 40 x 60 foot steel contraction joints embedded. There is a steel angle 2½ inches wide by 3 inches deep embedded in the slabs at either end of the joints, with 1-inch welded steel anchors 8 inches long. The 140,000 square feet of absorption process topping was also laid in 40 x 60 foot sections, and was then leveled flush with the top of the steel surface.

Fulfills Demand

In its six years of service, the floor has stood up to every demand. In the general warehouse area, loaded hand and walkie trucks, steel tipped skids and fork lift trucks have made no impression on it.

The most severe demand is made by a continuous line of 4-wheel trucks pulled by an overhead tow conveyor. Every 30 seconds, such a truck bearing loads up to 3000 pounds, rolls over every section of the floor in the path of the tow chain. Under tow, the front casters swivel slightly, adding a grinding motion to the ordinary wear. Despite this severe action, however, there are no gouges, cracks, pit marks or other noticeable indications of failure of the topping. Amazingly, the steel contraction joints show definite signs of gouging and wear, according to company officials.

Maintenance Emphasized

The absorption process floor is easy to maintain, the company finds. The only equipment needed is one commercial vacuum sweeper operated on a part-time basis. The density of the floor contributes to sanitation

Operations

because there are no holes or pits where food particles or dirt can accumulate and evade the sweeper. Decayed food matter, if allowed to remain on the floor, would eventually lead to disintegration of the cement binding agent and ultimate floor failure.

First National also employs a continuous preventive maintenance program designed to add additional years of life to the floor. Fibre wheels are used in place of steel wheels on all of the 4-wheel trucks. Skids are never dragged across the floor, but are always moved by truck. Contents of broken containers are cleaned up immediately.

A direct comparison has been made by First National Stores between its absorption process floor and a conventional concrete floor, in a similar center, which has been in service one year less. Procedures and traffic in the two warehouses are almost identical, yet the conventional floor is showing signs of wear around the tow chain area. Pitting, resulting from the breakdown of voids in conventional concrete, is also noticeable.

Over 2000 Items on Floors

First National's one-story plant has storage space for over 2000 items on the floor, augmented by mezzanine and top shelves. There are 17 grocery selection aisles, 4 refrigerated rooms and 5 banana ripening rooms.

Along one entire side is a railroad siding with a unique switching arrangement which makes it possible to spot cars at the most convenient section of the platform without disturbing other unloadings. Half of the other side of the plant is occupied by a truck loading platform which can accomodate 17 semi-trailers at one time.

Goods are unloaded from the freight cars to the platform by hand and walkie trucks. The switching arrangement permits unloading at the door nearest the ultimate destination of the goods in the building. Fork trucks move products to their proper place in the grocery selection aisles according to code number, com-

(Continued on page 125)

GRINDING ACTION of casters does not affect the floor as overhead conveyor tows loaded 4-wheel trucks.

STEEL-TIPPED SKIDS are always moved by trucks, as part of maintenance program to prolong floor life.

CONVENTIONAL FLOOR in similar operation shows pit marks and other signs of wear after five years.

PLANNING EVENTS were: (seated) George G. Raymond, Jr.; L. West Shea, H. S. Jones, Sam Isaacs, Chester LeVine, Charles Fogel; (standing) George Giotis, Eric Pratt, John Owen, Evan Young and visiting Prof. Bridge, of Toronto.

PANEL 1 (above) was concerned with receiving and shipping.

PANEL 2 (below) discussed scrap handling and disposition.

PANEL 3 (above) covered storage, warehouse and yard handling.

PANEL 4 (below) dealt with problems of in-process handling.

CLINIC SETS

COMPRISING some 300, the largest audience yet to participate in a Traveling Clinic of the Material Handling Institute was attracted to the University of Buffalo on November 14.

The Buffalo meeting was sponsored by the AMHS Chapters of Cleveland, Hamilton, Niagara Frontier, Northwestern Pennsylvania, Pittsburgh, Rochester, Toronto, and the University.

The program consisted of a 9 A.M. welcome and orientation, panel discussions from 9:30 to 12:30, a luncheon to 2:30, and panels again until about 4:30.

Panel 1, on Receiving and Shipping, included moderators T. C. Dallas (Supervisor of Warehousing, Aikenhead Hardware, Ltd., Toronto) and Bertram Lankin (Shipping Superintendent, E. I. DuPont de Nemours & Co., Niagara Falls)—and panelists John G. Bucuss (Acme Steel Products Division, Acme Steel Co., Chicago); George Greenberger (Sage Equipment Co., Buffalo); Robert K. Lohman (Pittsburgh Steel Products Co., Pittsburgh, Pa.); Lee Cirillo (Towmotor Corp., Cleveland, Ohio); and Hal Stiles (The Yale & Towne Manufacturing Co., Philadelphia, Pa.)

Panel 2, dealing with Scrap Collection, Handling and Disposition, had as moderators John Boden (Superintendent of Plant Layout, Westinghouse Electric Corp., Buffalo) and Richard Dahler (Material Handling Engineer, Ford Motor Co., Stamping Plant, Buffalo). Panelists were David H. Cissna (Ingersoll Kalamazoo Division, Borg-Warner Corp., Kalamazoo, Mich.); Ray Dodge (Clark Equipment Co., Battle Creek, Mich.); E. W. Franz (May-Fran Engineering, Inc., Cleveland, Ohio); and J. C. Streb (The Union Metal Manufacturing Company, Canton, Ohio).

Panel 3—Storage, Warehouse and Yard Handling—included as moderators J. D. Scanlon (General Superintendent of Material Handling, Duquesne Works, U. S.

RECORD

Steel Co., Pittsburgh, Pa.) and Ronald H. Robison (Production Engineer, Talon, Inc., Meadville, Pa.). Panel members were C. E. Barner (The American Monorail Co., Cleveland, Ohio); E. D. Fagan (Heppenstall Company, New Brighton, Pa.); Jack Wright (Hyster Co., Danville, Ill.); and Carl Theobald (Jervis B. Webb Company, Detroit, Mich.).

Panel 4, concerned with In-Process Handling, had moderators J. E. Olsson (Senior Project Engineer, Eastman Kodak Co., Camera Works, Rochester, N. Y.) and David T. Bloodgood (Production Manager, McDougall-Butler Company, Buffalo, N. Y.). Panelists were A. M. Barrett, Jr. (Barrett-Cravens Company, Northbrook, Ill.); M. W. Heinritz (Gould-National Batteries, Inc., Trenton, N. J.), and William D. Black (Automatic Transportation Company, Chicago, Ill.)

On the Buffalo Clinic committee were Samuel H. Isaacs (Samuel H. Isaacs and Associates), General Chairman; Charles M. Fogel (University of Buffalo, Director of Industrial Liaison Div.), University Chairman; Albert H. Gille (R. C. Neal Co.), Chester LeVine (American-Standard Corp.), and Richard Waldow, in charge of organization; George Giotis, President of the Buffalo AMHS Chapter, (Trico Products Corp.) and Thomas V. Welch, The Carborundum Co.) in charge of seminars; and John R. Owen (Buffalo Chamber of Commerce), Roy Staff (C&D Batteries, Inc.) and Eric Pratt (The Carborundum Co.).

Also representing the Material Handling Institute were its president, George G. Raymond, Jr., (The Raymond Corp.) and C. West Shea (Material Handling Institute, Inc.). Attending for the AMHS was National President H. S. Jones (Dominion Bridge Co., Ltd., Montreal).

Featured speaker at the luncheon was Dr. Robert R. Dornberger, guided missiles consultant of Bell Aircraft Corp.

Pulsating neoprene panels inside the bin are PneuBin's secret weapon against bin flow bottlenecks. The PneuBin unit consists of steelbacked, neoprene, pulsating panels mounted on the inside wall of your present bins . . . and air controls to regulate the panels' action. By the pneumatic inflation and deflation of the PenuBin panels, the bin contents are positively displaced to insure free flow. After the panels have deflated, the air control unit (operating off the regular plant air supply) starts another cycle of inflation and deflation. The process continues *automatically* at whatever frequency is set on the air controller (this frequency is adjustable).

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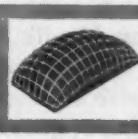
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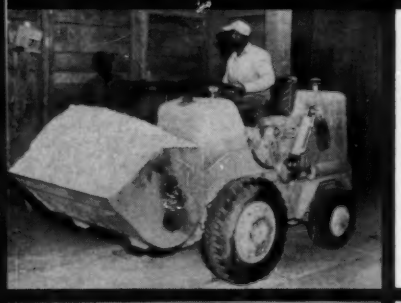
Better Engineered for

Shortest Turning Radius

The model HA can work where others can't because it has a shorter turning radius than any comparable tractor-shovel — can go through narrow doorways and between spaces less than 4½ feet wide. With a turning radius of only 6 feet 3½ inches it easily turns corners of 6 foot aisles.

Higher Dumping Height

This "PAYLOADER" can deliver its loads over bin or hopper edges up to 6½ feet high. The bucket in maximum dump position can clear heights of 5 feet 2½ inches with a forward reach of more than 2 feet beyond front of machine. Loads can be dumped as fast or slow as desired, and at any height.



Biggest Capacity (18 cu. ft. payload)

With a bucket capacity of 18 cu. ft. payload and 14 cu. ft. struck the model HA has a carrying capacity up to 25% greater than all comparative machines and even more than some bigger, heavier machines. Better engineering including the exclusive 40° bucket tip-back action are the reasons the model HA handles more tons per load and more loads per hour.

Easiest Operating

The entire hydraulic control of the model HA bucket — tip-back, raise, dump, lower — is handled by a single conveniently located lever. It's the simplest, easiest bucket control available. Smooth hydraulic brakes, full anti-friction steering mechanism and torque-converter drive makes the model HA easy to operate at high output rates the full shift.

Processing and manufacturing plants of all kinds report that the new model "PAYLOADER" tractor-shovels are not only a great improvement over earlier models but are also way ahead of other front-end loaders in design and productivity — can handle more tons of material per hour than heavier machines with larger engines. The exclusive 40 degree break-out and tip-back of the bucket at ground level gets and holds big loads close and low without spilling. Hydraulic load-shock-absorber smooths the ride and permits higher travel speeds. The low-mounted boom arm design makes operation faster, safer and easier because driver cannot get caught in mechanism and his line of vision is clear. Greater versatility is another valuable feature for many owners who use the floor-sweeper, fork lift, pusher forks and other available attachments that help make the model HA one of the most profitable machines any plant can own.

Unequaled Production

Owners *expect* more from a "PAYLOADER" and they *get* more because more "PAYLOADER" units have been built and are in service than all other wheeled tractor-shovels combined. Your "PAYLOADER" Distributor is ready to demonstrate a model HA, or a larger model from the complete "PAYLOADER" line.

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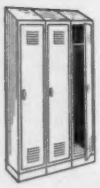

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AUTOMATIC WAREHOUSE

(*Continued from page 77*)

of work represents the bulk of the labor requirement.

The technical problems in automated material handling are largely matters of application, such as how to handle units of great size or weight and what kind of live storage should be used for tremendous quantities or varieties of goods which must be held for long periods of time. The answers to these problems and others which occur in every application may be found only in mechanical development work; in creative industrial engineering to develop new systems of managing inventory; and in economic studies which show that the savings justify an apparently large capital investment.

Future Changes

In the next ten years significant changes will take place in both the kinds of layout used for material handling and the equipment employed. Layouts will, to the maximum extent possible, follow the concept of continuous flow or completely "live" handling in and out. But equipment does not yet exist to make feasible live handling of all possible goods. Those warehouses which are set up for very rapid turnover, may, today, readily be converted to the "live" principle, but present racks, which are merely variations of conveyors, are too expensive for more than short term storage. Before "live" storage can be universally applied for more than short term storage, it will be necessary for manufacturers of conveyors or racks to produce inexpensive storage devices which can be linked to conveyors and to sorting and picking mechanisms and made part of a system.

The object is to be able to store very large quantities of goods of various weights and sizes on a first-in, first-out basis—at a cost which approximates the present cost of storage on pallets, including the cost of space, labor, and equipment. Actually, when such storage is linked to automatic input and picking, eliminating labor cost, a considerably higher cost of

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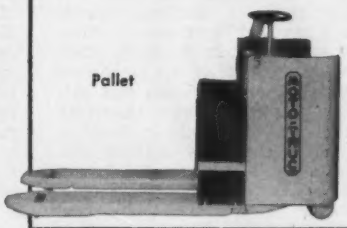
Builds Riding Models Too!

Originators of the "Walkie" truck also offer a complete line of "Ride-a-man" models.



Do you need an industrial truck that combines the speed and convenience of a rider type with the lower cost and maneuverability of a "walkie"? Then Moto-Truc "Ride-A-Man" electrics are your answer. They are light weight and small, yet packed with plenty of power for a full eight hours operation on most jobs. No need to sacrifice quality or dependability either. Moto-Truc skill gives you features like these —

- **Powerful Drive** — heavy duty, 18 volt motor with chain first reduction, spur gear second reduction drive unit.
- **Direct Acting Brake** — automotive type brake mounted directly on the drive wheel is operated by foot pedal.
- **Responsive Controls** — convenient roller grip control, designed by Moto-Truc, is easy to operate and simple to maintain.
- **Easy to Service** — completely accessible for quick easy maintenance.

Although built to operate in narrow aisles and congested areas, "Ride-A-Man" trucks give the operator a break too . . . plenty of standing room . . . outstanding all around vision make them safe and comfortable to operate all day long.

If your job calls for a small rider type truck — compare values and you'll always buy Moto-Truc.

Get All The Details

Write for either, or both, of these brand new catalogs —

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56-W "WALKIE" MODELS

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This C-F Coil Lifter, under control of the Crane operator handles hundreds of coils a day in a large mill... wide, narrow, and of varying tonnage. Fast, infinite adjustments of the motorized legs permit quick pick-up and set-down. Legs can be opened to any width and held... no need to open to maximum width to handle narrow coil. Maximum of 12" required between coils of any width—saves storage room.

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live storage equipment would, in fact, be justified.

In the absence of economical equipment for long term "live" holding, the logical direction for development is toward low cost machines for de-palletizing or unscrambling. Such equipment will make it possible to plan flexible systems for storage on pallets to maximum height, followed by automatic feeding into relatively short automatic order picking racks as goods are required for outgoing shipment.

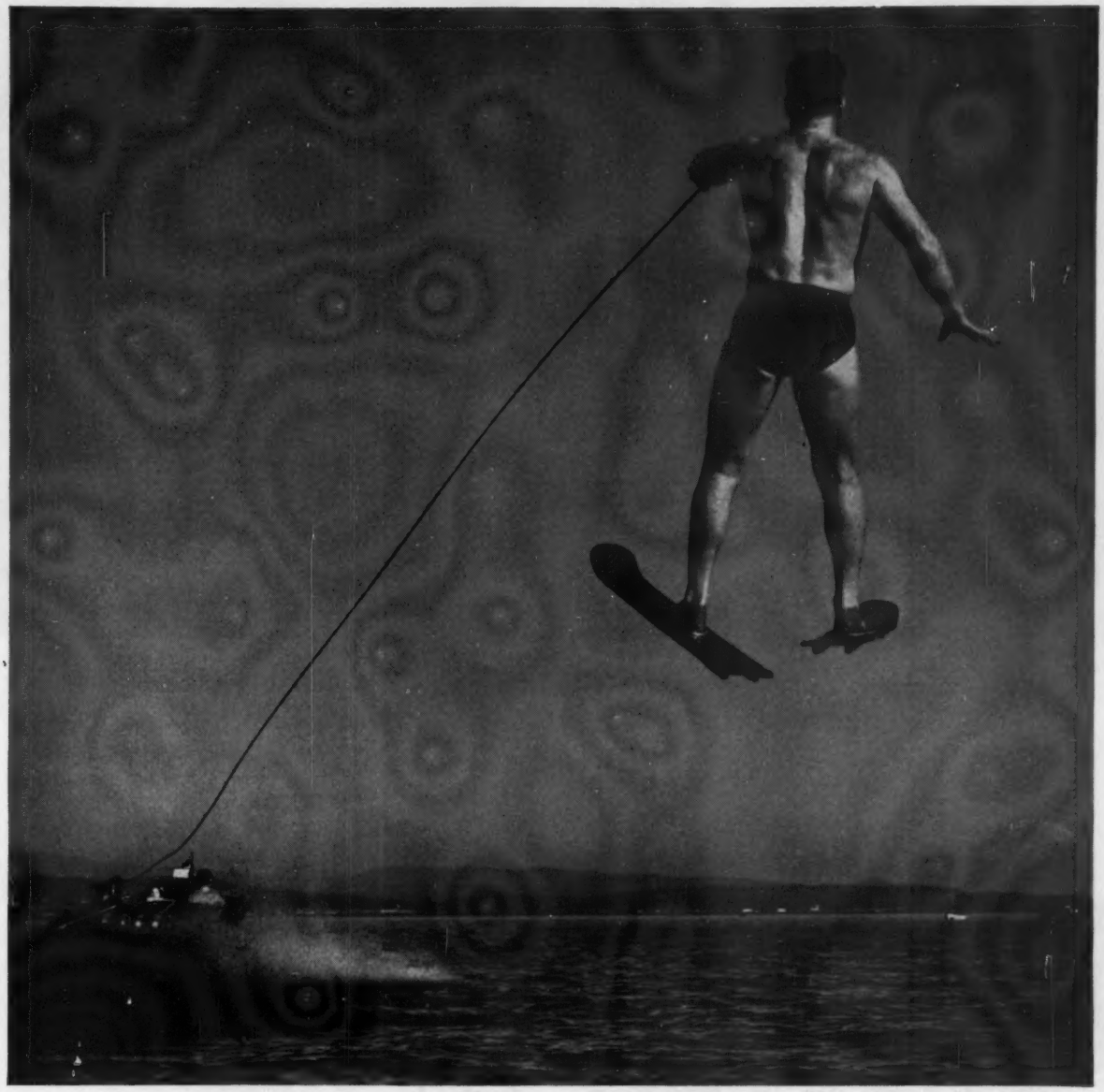
Another valuable development would be economical live storage racks for full pallet loads. Control equipment is capable of directing the movement of full pallets as required, but equipment does not now exist for the economical storage of full pallets on a "live" basis. The greater quantities handled would justify heavy duty equipment. A given amount of rack might well serve, in the case of storage or outgoing shipments of full pallets, for a multiple of 50, or even more, as compared with single unit racks.

Cost or Investment?

Economic analysis frequently shows that what appears, superficially, to involve excessively high capital cost becomes an imperative investment when equated against the savings potential. The *Summary Cost Analysis,* Figures 5, 6 and 7, show an actual case as presented to a Board of Directors contemplating a new warehousing program.

The analysis assumed a stable wage and price level. Note that the company, when faced with an actual installation, thought in terms of savings or additional profit before taxes. However, *pay out time* is frequently used as a rule of thumb in determining the feasibility of capital investment for new equipment.

Figure 8 illustrates, in general, how increased wages affect pay out time. This table explains why the introduction of automation is accelerated by increasing wages, and why it will probably come



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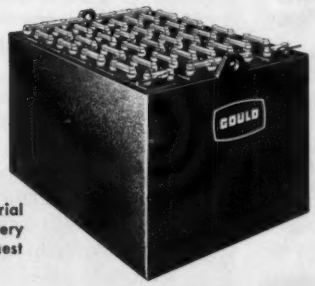

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WHEREVER YOU GO you're likely to find through-the-air handling in use . . . even 350 ft. underground. This Shepard Niles Crane, for example, is installed in a coal mine's underground machine shop. The 19 ft. 6½ in. span welded beam crane aids in the repair of equipment, providing a swift, safe, economical method of handling.

Why not put your plant's handling overhead . . . out of the way . . . with a Shepard Niles Crane. Shepard offers you a complete line of cranes for light, medium or heavy service . . . designed for constant or intermittent duty in slow, medium and high speeds. Operated from pulpit, cab or floor, these Shepard cranes are composed of component parts built expressly for crane service.

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most rapidly in the U.S.A. where wages are higher than in other countries. The amount available and justified for investment is primarily determined by the cost of labor.

Increasing sales likewise make automation more attractive as shown in Figure 9.

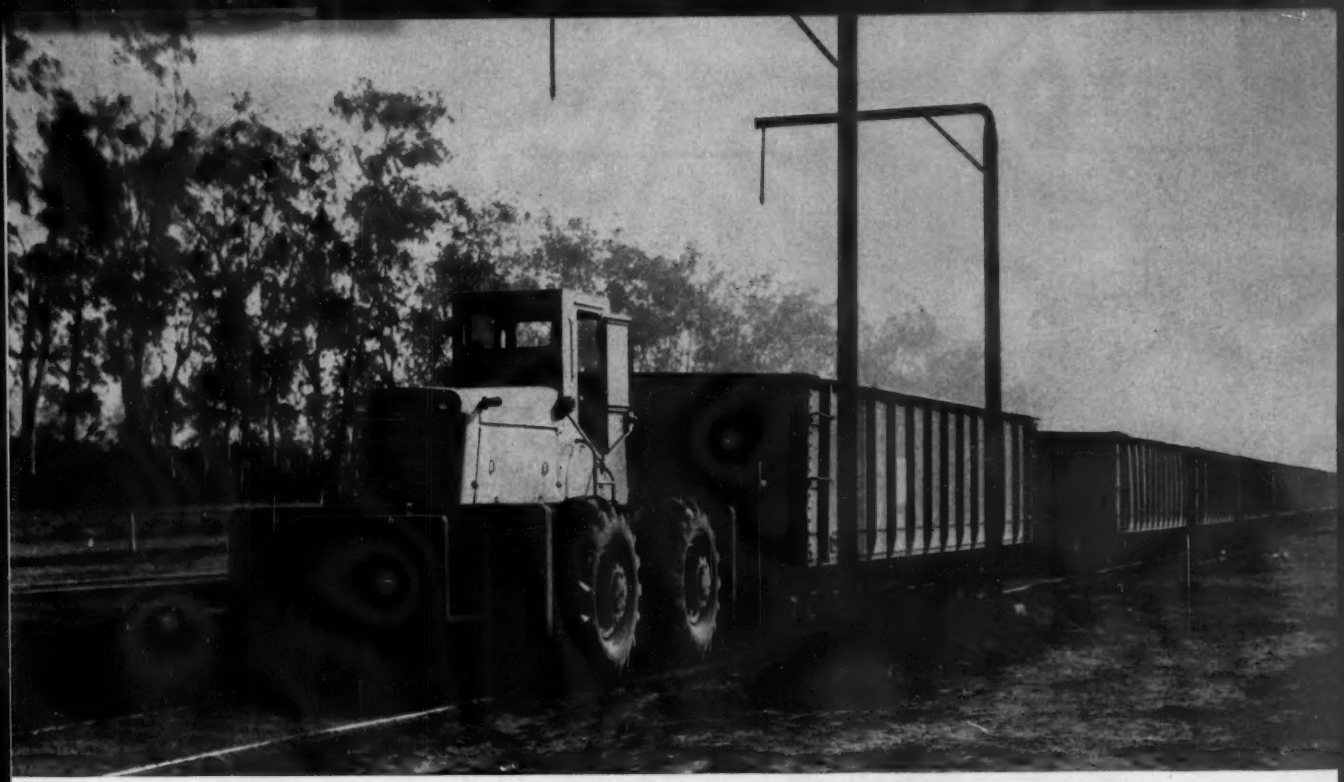
The matter of wages is by no means academic. It is possible for each company to chart its historical rate of increase in wage rates for each class of labor which it employs. Such charts will unquestionably show large and regular increases in the past ten years. There is no reason to believe that comparable increases cannot or will not occur in ten years.

A lift truck operator may be making $1.25 per hour. If the Teamsters' Union is successful in organizing such warehousing employees, will wages rise to $1.75 or $2.00 per hour? Thousands of warehouse employees in the South have recently had an increase of 33⅓ percent as a result of the operation of the minimum wage laws. Is it reasonable to expect that $1.00 is the ceiling for such labor? Or will Congress vote further increases? Besides wages, there is, of course, the growing cost of fringe benefits, supervision and staff services.

Studies Needed

The actual savings from automatic warehousing as compared with present manual or semi-automatic methods cannot be precisely determined without careful engineering studies. However, it is fair to state that, generally speaking, the more persons employed, almost regardless of the process, the greater the opportunities for savings. It is also reasonable to expect that, wherever 15 or more workers are employed in one operation, a minimum saving of 50 percent of direct labor cost is possible through automation.

With these broad rules of thumb, it is possible for anyone to make projections as to the minimum results to be obtained through automated warehousing. Careful engi-



To industries everywhere, Michigan Tractor Shovels have brought major savings in handling sand, rock and other bulk materials, stockpiling coal, loading lumber, and doing yard work. Now, here's a more unusual, but equally cost-cutting application:

SPEEDY SWITCHER for KAISER STEEL

All the in-yard railroad-car switching and spotting Kaiser Steel Corporation needs at their giant Fontana, California, steel mill is now handled by the mobile, dependable, 27 mph Michigan Tractor Shovel you see here.

Helps unload 6,000 tons of ore daily

Working around a revolving car unloader, the Michigan spots gondolas containing 6,000 to 7,000 tons of beneficiated iron ore daily. Most of these cars are towed, one by one, from trains spotted about 150 feet from the unloader. As each car is being dumped, the Michigan drives through the unloader building, turns, automatically couples and delivers another car. Complete 400 ft. cycles take only a minute. This includes time for the Michigan to move onto the unloader platform, spot and automatically uncouple the loaded car, then nudge the empty to a gently-sloping downgrade where it coasts to make connection with other cars already behind a braked pilot car. Speed like this is a major advantage —in fact, the Michigan works so fast it has time to handle all switching of *all limestone* and *silica* cars, too. Another advantage is that when the Michigan has finished unloading an ore train, a trainload of empties is practically made up—except for hooking air hose connections —for the 160-mile return trip to Kaiser's iron mine at Eagle Mountain, California.

To adapt their Michigan for railroad-car pulling service, Kaiser's crew replaced its standard 2¼ yard shovel bucket with a switching toggle mounted on a heavy spring-loaded plate. A second spring-loaded plate mounted at the rear, provided pushing surface for jobs where switch connections were not necessary.

Moves 3600-ton train-load

Sometimes, the Michigan has to move both loaded and empty trains. The day these photos were taken, for example, it pulled a train of 60 cars—each car loaded with 60 tons! Men on the job say the unit, a 133 hp Model 175A, often handles this many cars when locomotives are busy elsewhere and a brakeman is available.

Faster, less expensive than locomotives

Switching didn't always go this smoothly at Fontana. For years, switch engines handled the job. But as nine open hearth and three blast furnaces were opened and later pushed to 108% of design capacity, car traffic became heavier and heavier, and locomotive switching slower and slower. Other drawbacks showed up, too. Locomotives were expensive to buy and maintain . . . and, naturally, limited in mobility. So Kaiser officials tried a variety of highly-portable rubber-tired rigs. Their choice: Michigan! Michigan Tractor Shovels, they found, have greater traction because their four wheels are always driving, even on turns. Push-power is always high because of 3-to-1 torque converter and matched all-Clark power train. Planetary drive axles eliminate axle breakage. Top speed of 27 mph cuts job-to-job travel time.

Get a demonstration and see

Advantages like these are reasons enough, aren't they, to copy Kaiser and give Michigan a try on your job? Write us, any time, to arrange a demonstration on the work you want this rubber-tired rig to do—switch cars, load sand, stockpile coal, etc. Just name the jobs and size machine you want to see (15 cubic feet to 2¼ cubic yards, 44 to 165 hp).

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neering studies should find additional savings.

Figure 10 shows, generally, how the size of the operation affects opportunities to save and amount available for capital investment.

Very little, if any, automatically controlled equipment could, or probably should, be installed where only 10 persons are employed. Where 20 persons are employed, some degree of automation is almost certain to be feasible. Where as many as 100 are employed, the savings are potentially large enough to pay for almost any system. Also, it will usually be found that the more employees involved, the greater the opportunities for savings, percentagewise. A minimum working force may be required for almost any operation, regardless of the degree of automation. The same minimum force might well serve a large operation. Thus, the direct labor saving might be 50 percent on 20 employees but become 75 percent on 100 employees. This change in percentage of saving would reflect itself by making much larger funds available for equipment. Thus, Figure 10 might well have used an ascending scale as in Figure 11.

Work, Not Magic

It should not be assumed that fully automatic warehousing and material handling will come about as if by magic. However, the remaining theoretical problems are much less serious than some of the problems of control that have already been solved. Companies need to accept the fact that they can now have automatic warehousing and material handling and must gear their staffs to achieve this economy. But managers, engineers and other specialists will have to be trained both to build and install such systems and—more important—to think in terms of the ultimate in automaticity.

Contrary to the belief of many managers, automatic procedures are not the exclusive province of control specialists. In fact, the control specialist may not know how to apply his knowledge to prac-

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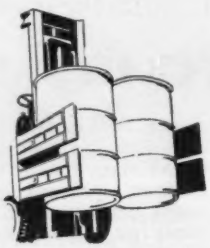

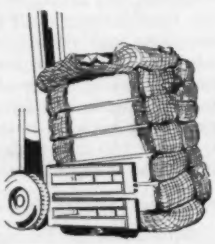

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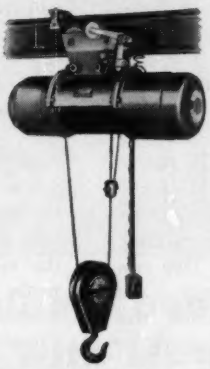

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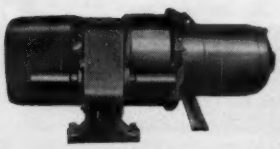

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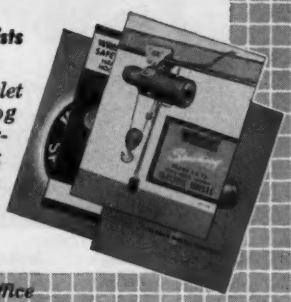

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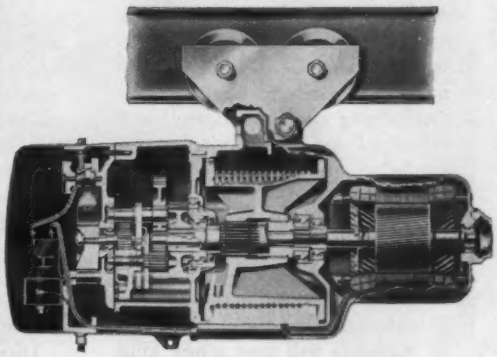

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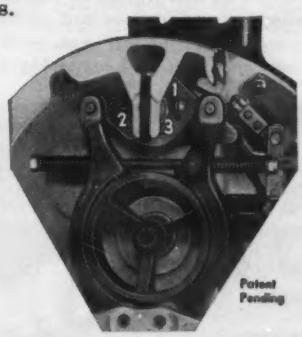

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Adjustment of this cam-actuated brake to compensate for brake lining wear is simple as ABC. When excessive load hook drift occurs...remove the screw shown at Position **1** (*see picture*), swing the cam until Position **2** is in line and replace the screw. That's all there is to it. For the final third of brake lining wear, set the cam at Position **3**. This is the only adjustment required. Brake springs and solenoid never need adjustment.

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tical problems. This is work for teams of engineers under the leadership of managers whose eyes are open to what can be and should be achieved. The use of controls to achieve the most efficient handling program requires pooling the skills of electrical and electronic engineers familiar with all that modern control equipment can be made to do; mechanical engineers capable of designing new mechanical components such as special purpose deflectors, braking and discharging mechanisms, etc.; and industrial engineers who, while firmly grounded in conventional rationalization, are able to think in terms of completely new systems made possible by the existence of modern control technology.

In order to obtain the benefits of automatic handling, the teams of engineers will need a new kind of training. Emphasis will have to be placed on developing their creativity. They will have to be shown that it is often easier and quicker to develop an entirely new automatic system than to try to improve on a conventional method. They must be trained to save dollars, not pennies.

Engineering imagination must be permitted to roam freely. If a scheme can be imagined, it can most likely be built. The new textbooks, at the same time that they present knowledge and encourage discipline, must also emphasize the value of combining skills.

There will have to be even closer teamwork between architects and engineers. Architects already understand that factories and warehouses must be housings around machines or goods. But they must be prepared for construction problems beyond the present horizon of architectural design. We will need different shapes if material is to be put in at the top, kept live, processed and taken out at the bottom, or if we can no longer have backtracking.

Directors will have to face new concepts of obsolescence, not whether a present method still works but whether it must be junked in the interest of installing systems which "take off", producing previously undreamed of operating savings.

Because automatic material handling systems must be custom designed for each application, they cannot be "package deals." Development work will have to be done. It may not be extensive or expensive, but the rewards in sight justify checking out every reasonable hypothesis.

Each and every concept of automatic material handling cited in this essay is either in use or under construction, or is being checked out by engineers prior to actual construction. The extension of these ideas requires only the willingness of more companies to accept an advanced creative approach to material handling. If we concentrate immediately on seeing how new principles of automatic material handling can be most economically applied to specific situations, and on developing the necessary mechanical components, then automation in warehousing will be achieved to a large extent by 1966.

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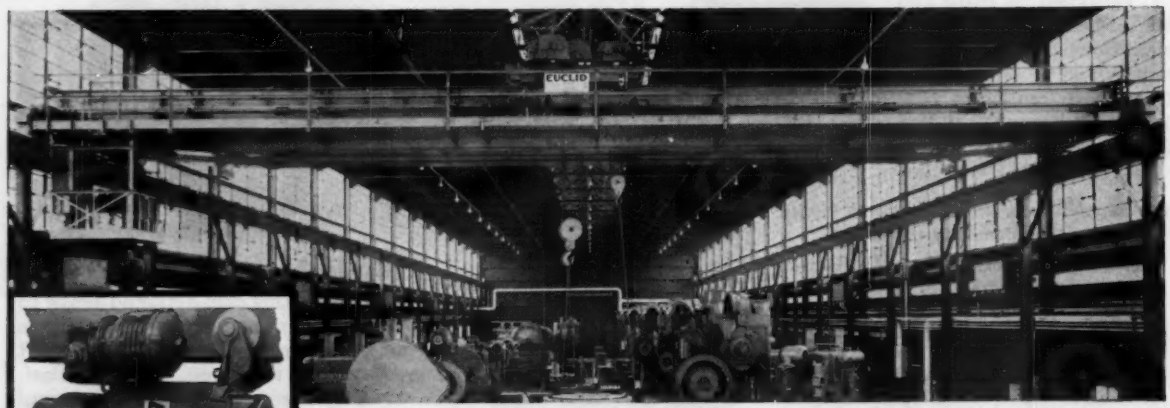

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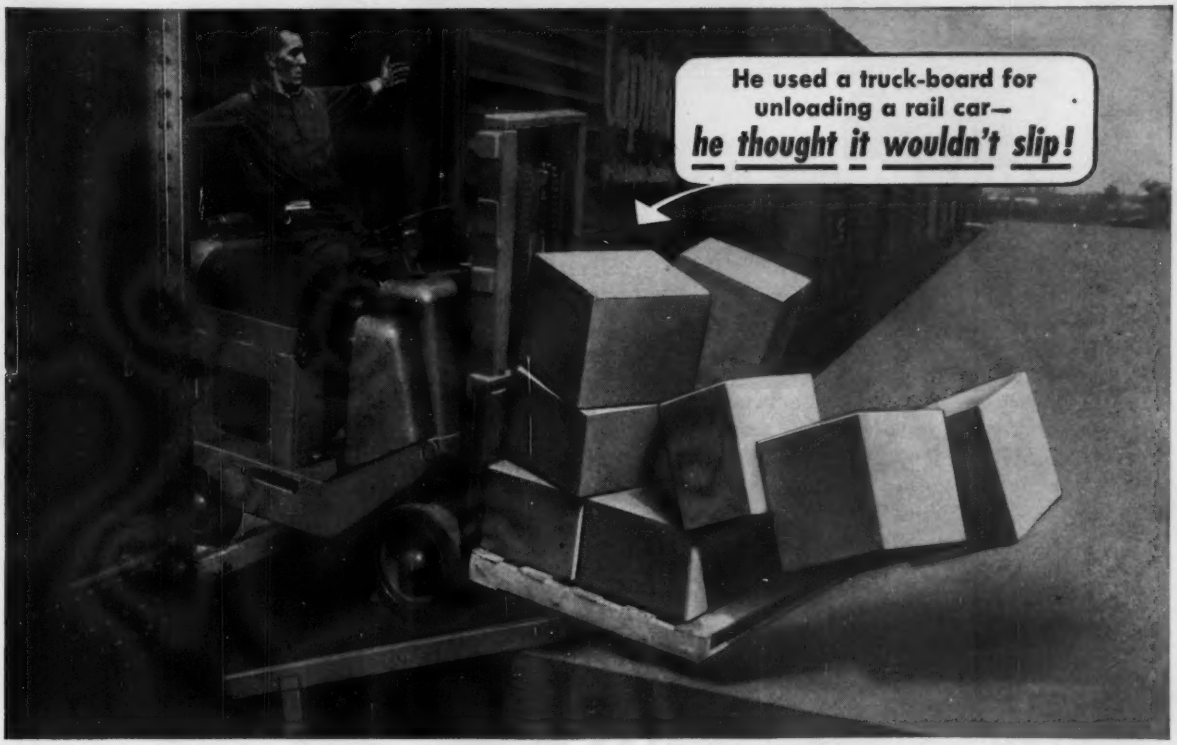

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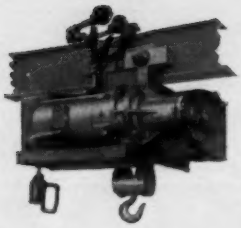

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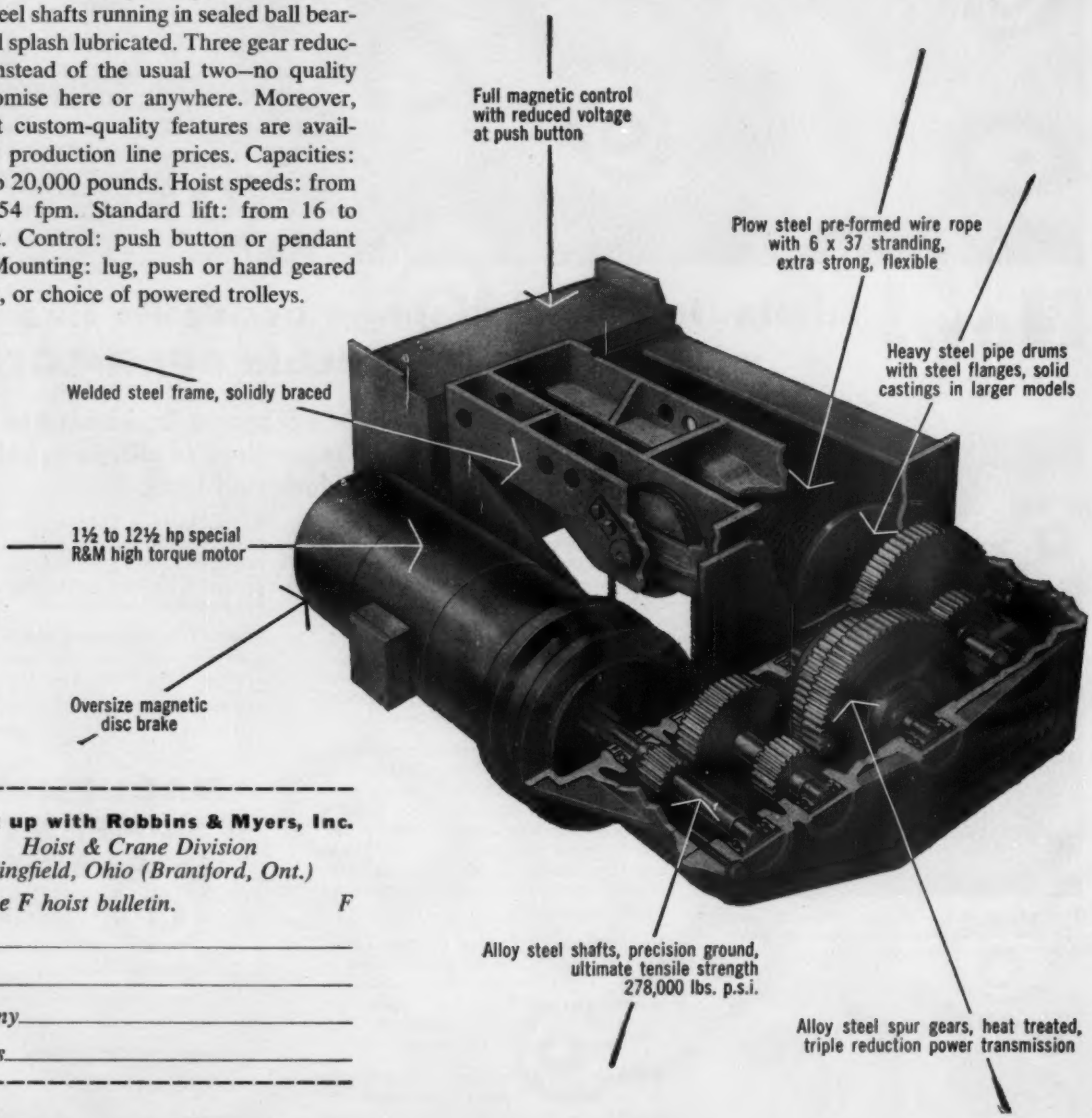
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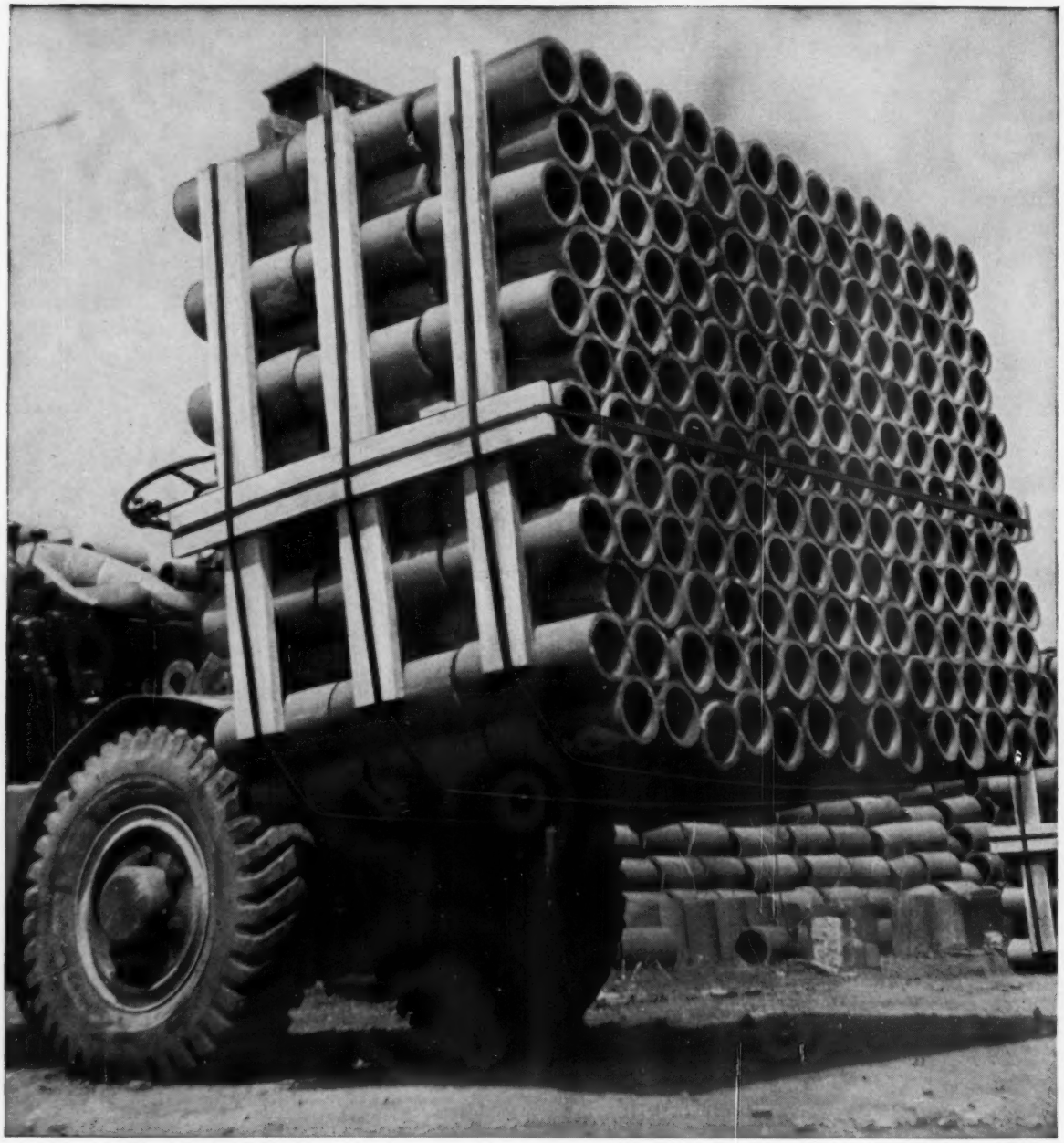

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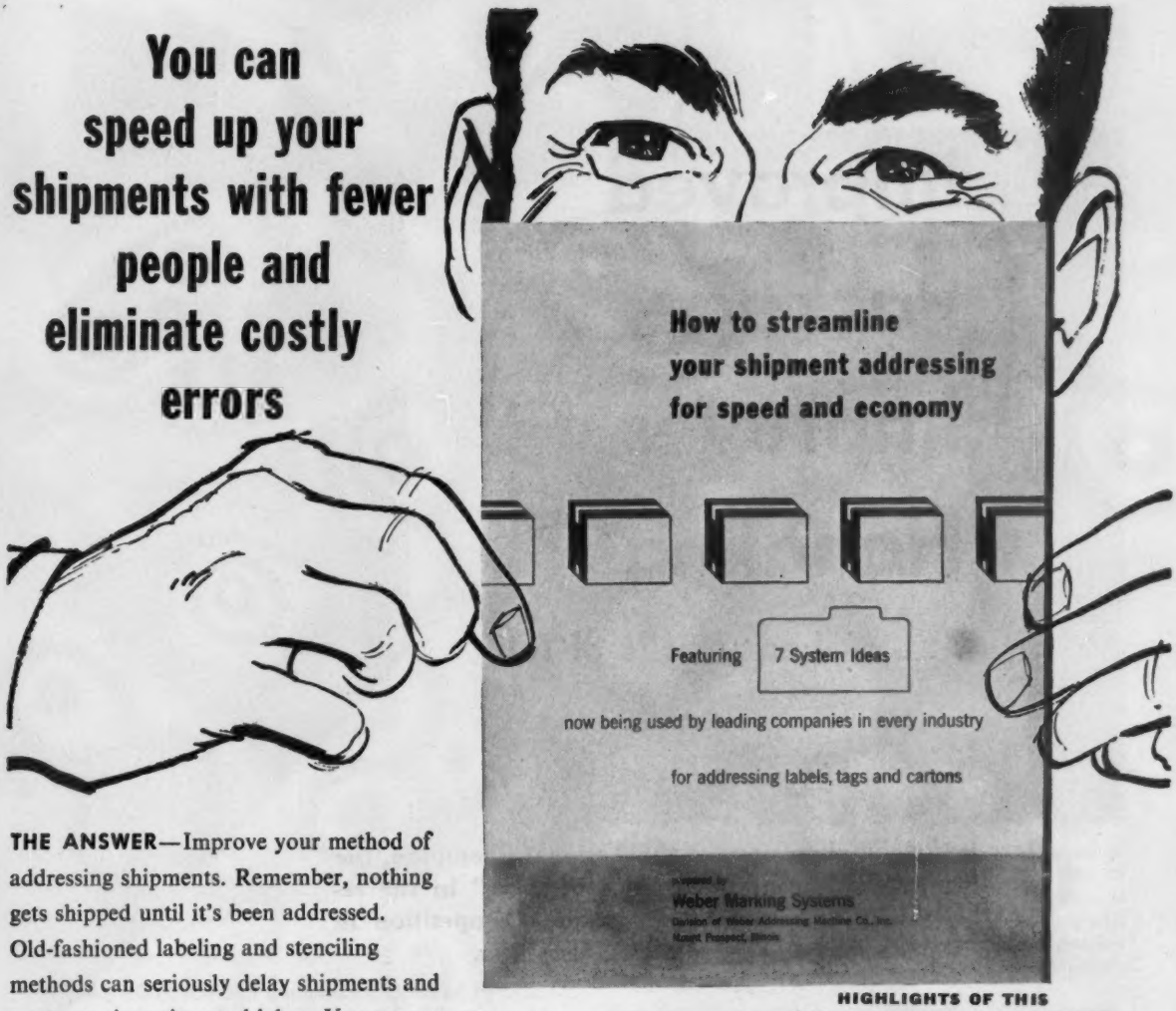
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for speed and economy
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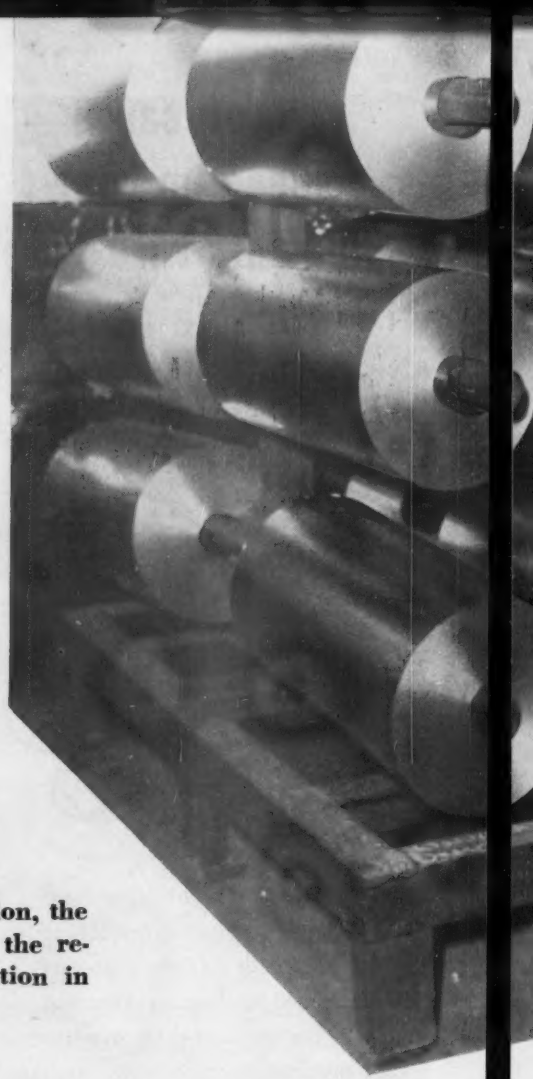
Improved Package Improves Handling

. . . of heavy rolls of foil



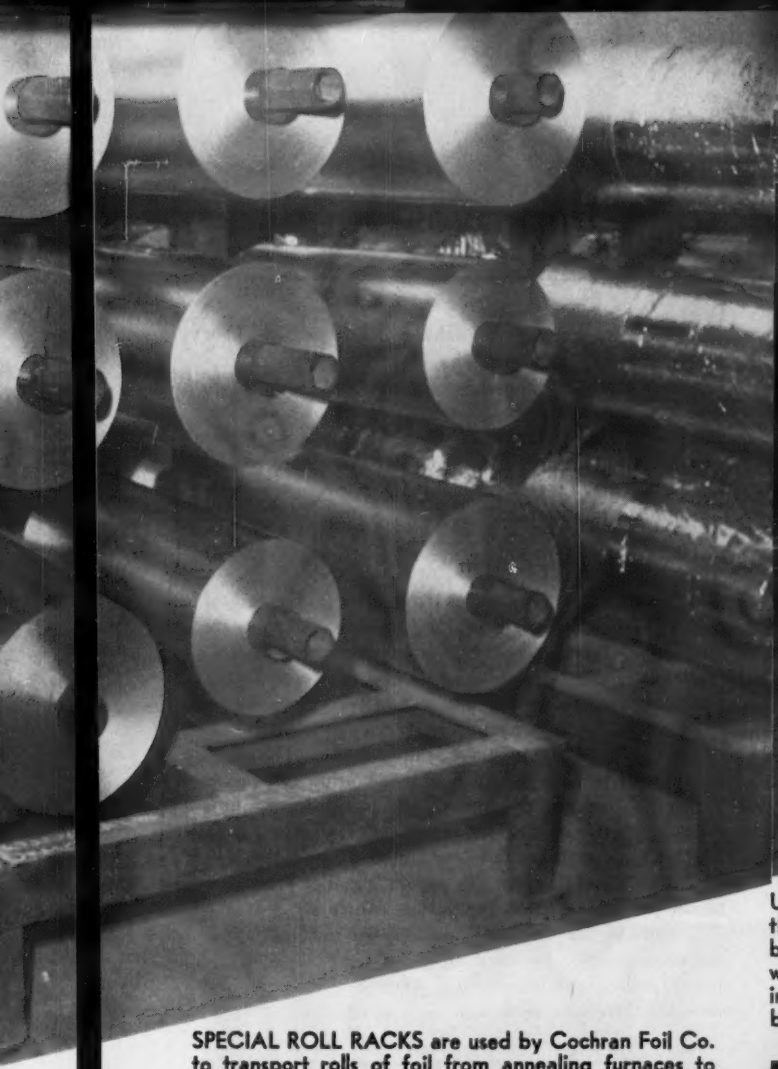
Here is the complete story of the National Champion, the container which was declared "Best-of-Show" in the recent SIPMHE National Championship Competition in Packaging and Material Handling.

A 300-pound roll of aluminum foil presents serious packaging, handling and shipping problems. Because of its cylindrical shape and heavy weight, it is awkward to handle. Take into consideration the ease with which it may be damaged by rough handling, and it becomes quickly evident that the shipping package is one of the most critical elements of the entire distribution phase. For, it is the package which must provide protection against handling hazards while, at the same time, it increases efficiency in the packaging operation and all other handlings.

It has been general practice to prepare rolls of foil for the hazards of handling, storing and shipping by packaging them individually, or in unit loads, in costly made-to-order boxes. That practice invariably makes necessary a large inventory of box materials and often results in establishment of a box shop whose production schedule has to be meshed with the manufacturing rate of the plant. Valuable space is devoted to box-making equipment as well as to storage space for the heavy inventory of materials. Furthermore, because each box is made to order for the specific load it is to transport, time and labor costs are often excessive.

By Donald W. Everett
Cochran Foil Co.

At Cochran Foil Co. we have solved these problems, and achieved several bonus benefits, through a unique wirebound container and an efficient packaging method which it has made possible. The box is different from the usual wirebound in that the wraparound mat is positioned so that it forms the bottom and two sides, rather than the usual four sides of the container. That unusual design has resulted in a box which has excellent protective and stacking qualities and which is quite simple to pack.



SPECIAL ROLL RACKS are used by Cochran Foil Co. to transport rolls of foil from annealing furnaces to packaging. This rack holds 18 rolls weighing a total of packaging. This rack holds 18 rolls weighing 7000 lb. Other racks, for rolls with a smaller O.D., will hold 32.

UNUSUAL SHIPPING CONTAINER is constructed so that wirebound mat forms bottom and two sides of box. Here, packaging sequence starts when mat is wrapped around v-notched end-pieces and strapped in place. Unit is then turned, so that completed portion becomes bottom of box, and is set on wooden pallet.

In addition to the wrap-around mat, the container consists of two three-sectioned nailed wood ends and a wirebound cover. A double row of cleats along each edge of the mat provides grooves into which the end pieces fit. V-notches in the end-pieces (in which roll cores ride) are positioned so that they lock rolls away from each other and away from the top, bottom and sides of the container. Simple rock fasteners and three bands of ¾" x .020 steel strapping provide reliable closure and reinforcement.

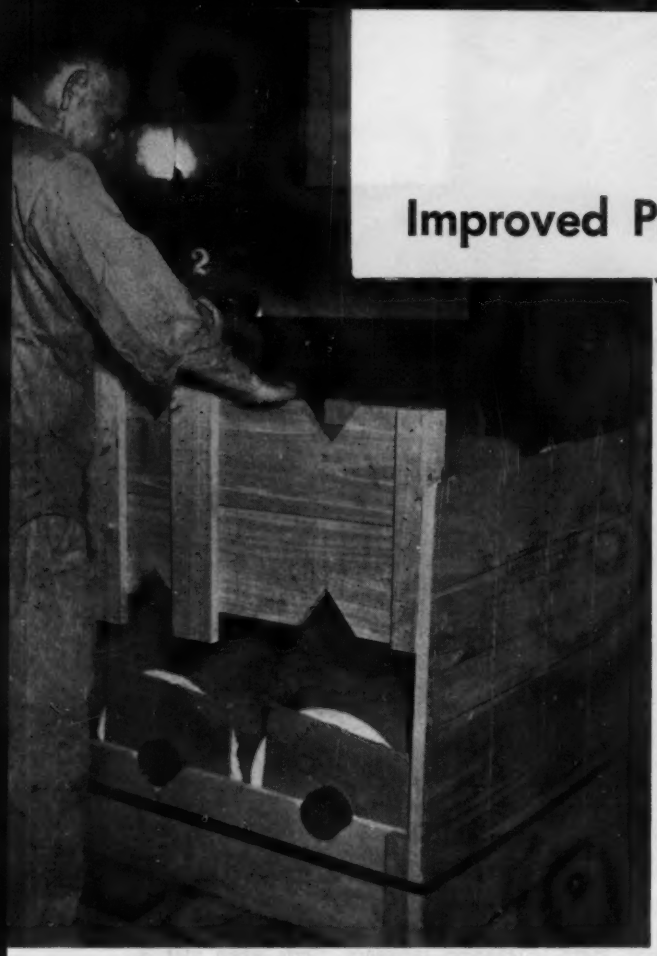
Boxes are supplied knocked down and unitized. Mats are unitized separately from the end pieces. Thus, inventory-taking is a simple matter because each unbroken load is certain to contain a predetermined quantity of a specific box part. The compact steel-strapped loads permit us to store a large quantity of wirebound boxes in a relatively small space.

Cochran Foil Co. produces aluminum foil in various

(More on next page)

C-HOOK suspended from monorail is used to lift 300-pound rolls from roll rack to wirebound box. V-notches in end-boards of box are positioned so that roll is suspended away from bottom of box and from other rolls. This box will hold six rolls in two tiers when completed.

Improved Package Improves Handling of



INTERMEDIATE END-PIECE slips into grooves provided by double cleats on wirebound mat. The end-piece holds bottom layer of rolls firmly in place and provides v-notches for next layer to be placed into box.

specifications for use in making items such as beer labels, chewing-gum wrappers, cigarette wrappers, frozen food trays, condenser wrappings and cable wrappings. Our raw material consists of foils of aluminum sheet which are reduced to desired gauge in a series of rolling operations. Finished rolls of foil are placed on special racks which transport them through annealing and on to packing.

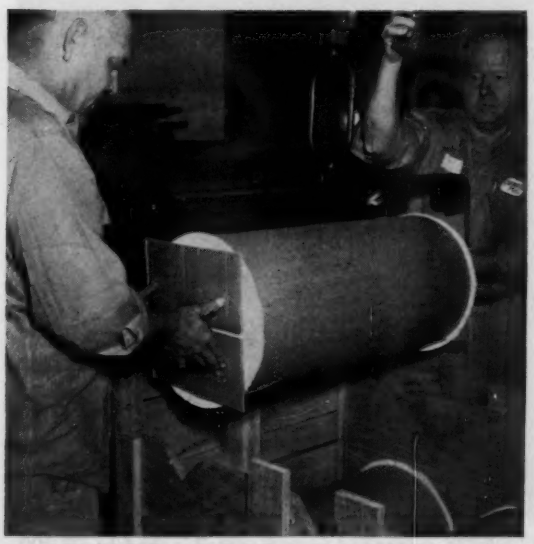
The Packing Operation

A six-man team packages rolls at a top speed of two 2000-pound loads every 10 minutes. The team includes two pairs of packers, a bander and a man to make out and attach case tickets and to prepare other necessary papers. As the first roll is being transferred from the rack the box set-up is started.

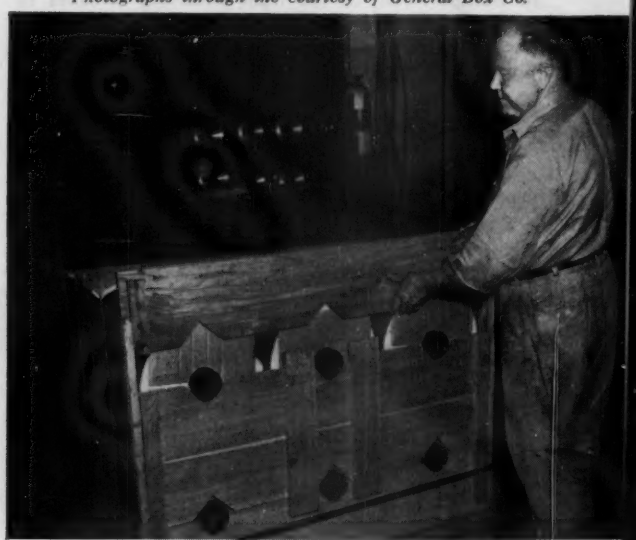
Set-up for packaging is a simple matter. The wirebound mat is wrapped around two bottom end-pieces which fit between the previously mentioned double rows of cleats on the mat resulting in a strong tray-like unit. A steel band is tensioned around the unit and that basic container is set on a pallet. The container filling operation is ready to start.

V-notches, cut into the end-pieces by the box manufacturer, provide for accurate spotting of cores of the heavy rolls of aluminum foil when they are lowered into the box. As each roll is deposited into the v-

Photographs through the courtesy of General Box Co.



CREPED WADDING PADS and corrugated spacers are put on ends of each roll of foil before it is deposited into the shipping container. This protects easily damaged edges of foil from being torn if rough handling is experienced during handling or shipping.



TOP END-PIECE, when dropped into place, locks top tier of rolls firmly in place. All six rolls contained in this box are floated away from sides and bottom of the box as well as away from each other. Box is now ready for top to be put on and for completion of shipping unit.

Heavy Rolls

Continued

notches, the packers place a creped-wadding pad and a corrugated spacer onto each end.

When the first row of rolls has been completed, a second end-piece is slipped into the grooves on the mat. V-notches in the lower edge of that end-piece meet with the notches in the top edge of the bottom piece to form triangular holes in which cores of the bottom tier of rolls ride snugly. Similar v-notches in the top edge of the piece provide for a second tier of rolls. After that tier has been loaded into the container, a final end-piece is slipped into the grooves and the shipping container is ready for application of the cover and closure.

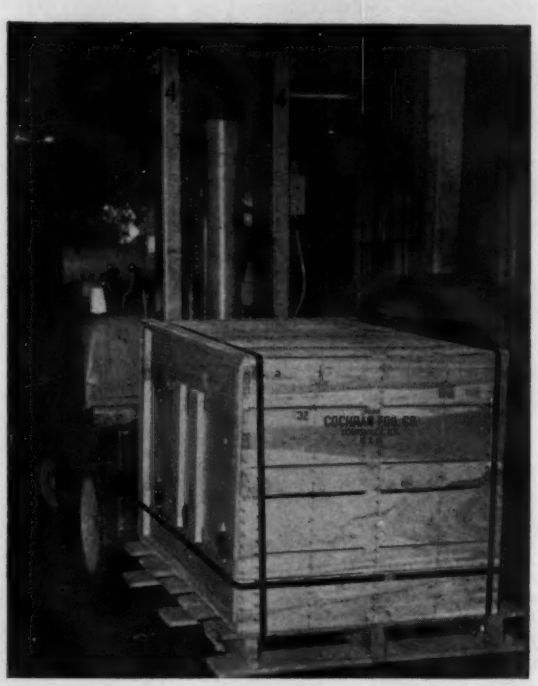
The cover is simply a length of wirebound mat with rock fasteners at each end. As it is set in place, loops on the box fit into loops on the cover and a single hammer blow on each of the interlocking loops results in a strong, reliable closure. To provide additional strength to the pack and to give added insurance to the closure, two more lengths of strapping are tensioned vertically around the completed unit. We have

(More on next page)

ADDED REINFORCEMENT is provided by ¾" x .020 steel bands which are tensioned around ends of the filled box. The bands fit around top deck-boards of pallet to insure a solid unit load for handling and shipping. Unusual corner strength is provided by the wire supports. Also, wirebound construction cushions impacts.

WIREBOUND COVER is constructed with double cleats along each side to provide grooves which fit snugly over top end-pieces. When top has been positioned on box, closure is made quickly by a single hammer-blow on each fastener. Filled box weighs approximately 2000 pounds and contains six rolls of aluminum foil. Using only five mat sizes and two sizes of end-pieces, Cochran can package four, six, or eight rolls of aluminum foil, in any width from 20 inches to 37⅛ inches. Boxes may be mounted on pallets or wooden runners.

Continued



UNIT LOAD, made up of six rolls of .00035" aluminum foil weighing approximately 300 pounds each, is moved by fork truck from packaging department to storage.

found that by passing the bands underneath the top deck-boards of the pallet a solid, easily handled and stacked unit load results.

Completed loads are taken by fork truck from the packaging department to the shipping dock or to a warehouse area where they are stacked three-high, normally, and sometimes four-high.

We have been able to standardize our containers so that with only five mat sizes and two sizes of end-pieces we can package in quantities of four, six or eight rolls in any width from 20 inches to 37⅛ inches. The five mat sizes were established to conform to standard core sizes.

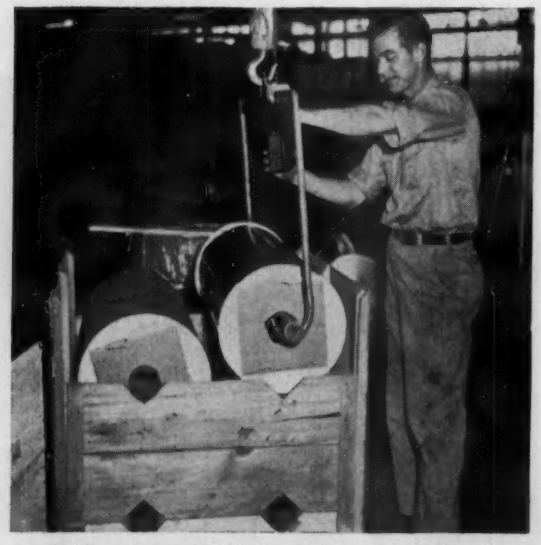
Only four sizes of pallets are necessary to handle all the boxes which we ship. They are: 40″ x 45″; 43½″ x 45″; 30″ x 45″; 40″ x 40″. Of those, the first three are the most frequently used.

Advantages

Advantages of the new method, to both Cochran Foil Co. and to its customers, are many, including:

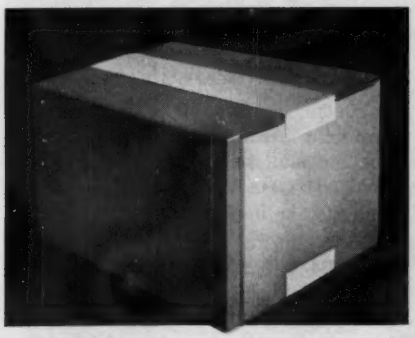
1. *Freight Savings*—Tare weight of the new boxes

(Continued on page 150)



AT CUSTOMER'S PLANT mandrel is slipped through core of roll for removal from shipping container and placement into fabricating machine. Because box does not depend upon rolls of foil for any of its strength, it is possible for user to remove one roll, re-close box and put it in storage until another roll is needed.

GOOD STACKING STRENGTH of Cochran's roll boxes is derived from vertical cleats and heavy (⅞-inch) end-pieces. Normally, stacks are three boxes high in the warehouse. Occasionally, they reach four-high without endangering enclosed rolls of aluminum foil.



UNDER RULE 41 railroads have now approved the use of 2 strips of reenforced tape instead of 6 — and rugged Sisalkraft Sealing Tape is the tape to use. Its tough glass reenforcing withstands the roughest handling yet its flexibility makes for easy sealing. See your paper merchant or write us for more facts.

CORNER TAPED BOXES ARE BEST — You get even corners for good stacking . . . greater safety for the handler . . . no damage to merchandise. And they are best of all when closed with SISAL TAPE, the standard of the industry — or non-asphaltic LOKABOX, the world's strongest corrugator's tape.

SISALKRAFT

Glass-Reenforced

TAPES

AMERICAN SISALKRAFT CORPORATION
Attleboro, Mass.
Makers of base stock for the Gummed Paper Industry

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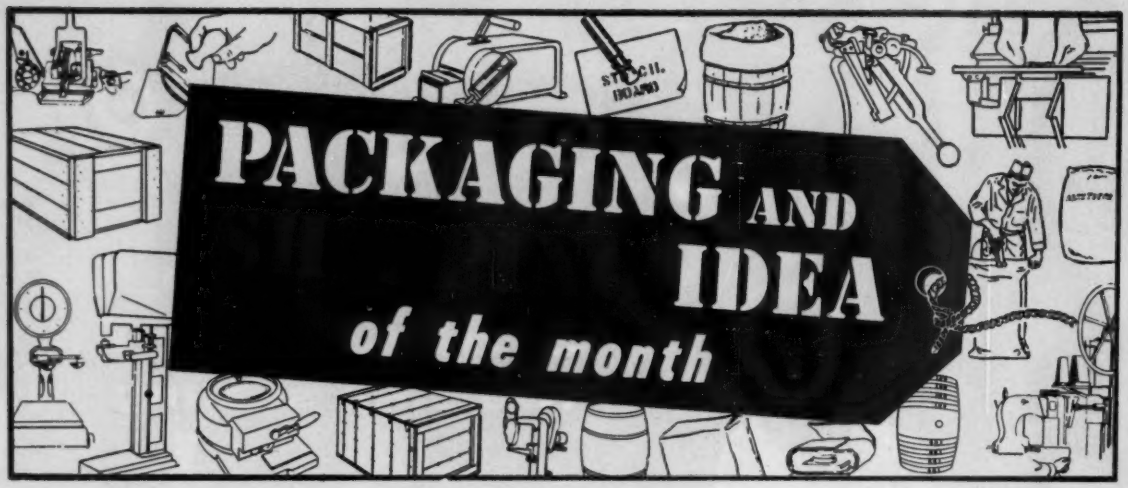


3-cent gadget

Saves $25 to $50 per Carload

LEAP-FROGGING coils of steel strip have been subdued with simple three-cent devices utilized by The Wallace Barnes Steel Division of Associated Spring Corp. The 3500-pound coils are shipped by box car from the Forestville cold-rolling mill of Wallace Barnes. Sometimes, in the past, when the going got rough, the coils played leap-frog. Damage claims and customer dissatisfaction resulted.

In the old method, skids were blocked with 3 x 3 or 4 x 4 timbers and strapped together to form a floating load of about 60,000 pounds. The floating load principle allowed the load to shift slightly under the impact of switching, relieving some of the strain put on the strapping. But, that was not enough.

Impacts as high as eight miles-per-hour were recorded. Strapping would break, loads would jump off skids, over blocking and, sometimes, doors were jammed or barricaded. The use of mechanical unloading equipment would then be impossible.

Anti-Skid Plate Stops Damage

The new loading method involves the use of a simple anti-skid plate, costing about three cents each, and applied with a single nail to each end of the runners of each skid. When the skid, with plates attached, is set on the wooden floor of the box car, the teeth bite into both skid and floor and hold the skid firmly in place.

Labor savings from the new car-loading procedure amount to between $25. and $50. per car load. Sub-

Tape-Bound Closures for Multiwall Paper Bags!

UNION SPECIAL Style 21800 H Bag Closing Machines, with 80600 H sewing heads, shown here, are heavy-duty, high production units for making low cost tape-bound closures on large multiwall paper bags.

A single foot pedal controls synchronized conveyor and sewing head. Automatic tape cutter on sewing head saves time and helps make operation smooth and easy to learn.

Sewing head and conveyor are quickly adjustable for varying bag heights and scale or platform height from floor. Entire unit is ruggedly built for dependable service in high-volume production.

Ask for a copy of this Bulletin

It's easy to find just the right unit to meet your individual needs in Union Special's big line of bag closing machines. Ask for a copy of Bulletin No. 200, "UNION SPECIAL FILLED BAG CLOSING MACHINES"

Union Special
MACHINE COMPANY
415 N. FRANKLIN ST., CHICAGO 10, ILL.

Circle 109 on Reader Service Card

stantial material savings have also been realized. Best of all, however, is the improvement in protective qualities. Floating loads packed in this manner have withstood switching impacts of eight miles-per-hour without moving more than six inches. Wallace Barnes has not had a customer complaint in two years. And, the reduced shipping costs have extended the competitive market area for Barnes steel.

NEW METHOD uses simple anti-skid plate, costing about three cents. Applied with a single nail, one plate is placed at each end of a skid and teeth bite into both skid and floor to hold load firmly.

OLD METHOD had skids blocked with 3 x 3 or 4 x 4 timbers and skids were strapped together to form a floating load. Method did not relieve enough of the strain on the strapping. Loads often played leap-frog with costly results.

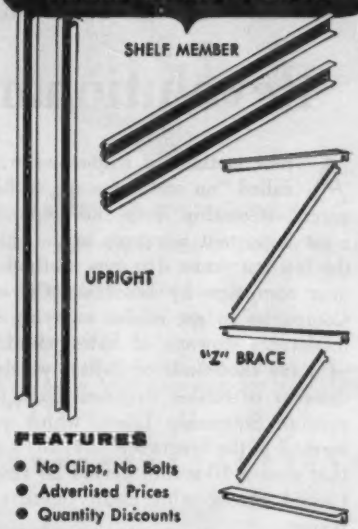
NEW TEN TON* CAPACITY

The Boltless Pallet Rack

AS LOW AS $8.35 PER PALLET OPENING**

*15-20 and 25 TON CAPACITIES also available. Prices on request

THREE BASIC PARTS



FEATURES

- No Clips, No Bolts
- Advertised Prices
- Quantity Discounts
- Erected in 10 minutes
- No sway in any direction
- Adjustable Shelf on 9" Centers
- No back braces—front or back entry
- Each Shelf independently adjustable

**PRICE AT MAXIMUM QUANTITY DISCOUNT

DISTRIBUTED IN PRINCIPAL CITIES

RACK ENGINEERING COMPANY
131 SIXTH ST., CONNELLSVILLE, PA.
Plants: Connellsville, Pa. • Gardena, Calif.
Farnham, Canada • Slough, England

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INDIVIDUAL BALES of crepe rubber are easily separated for unloading from hold of steamship in New York Harbor. Formerly, bales tended to cluster into huge masses unless they were separated by costly dunnage materials. "On-end" stowage takes advantage of burlap patches on bales to eliminate fusion.

Simple Change to "On-End" Stowage Results in . . .

Revolutionary Rubber Shipping Method

A new method of ship-stowage for crepe rubber, called "on end" stowage, is being hailed by insurers, steamship lines and importers as one of the most important advances in the shipping industry in the last ten years. The new method, a result of a two year campaign by Insurance Co. of North America Companies to get rubber carrying steamship lines to modernize stowage of bales, eliminates expenditures of many thousands of dollars yearly and speeds final delivery of rubber shipment from the Far East. Isthmanian Steamship Lines, which pioneered the new method at the insurance company's suggestion, reports that over a 10-month period 20 vessels arrived in the United States with clean out-turn and absence of fusion.

Crepe rubber has always presented a shipment problem to steamship lines because of its naturally tacky state. Rubber is shipped from the Far East in unprotected bales bound by heavy steel bands. Unless the bales are kept apart during shipment, they tend to adhere to each other, clustering into huge masses in a ship's hold. In order to prevent fusion, it has been past practice of stevedores loading vessels to use dunnage, such as boards, or reed mats, between the layers of the bales of rubber. More recently, coated paper or plastic sheets were used. Although the use of such dunnage material eliminated the fusion of bales, a new problem was presented—the dunnage material became imbedded in the bales and adhered to the rubber. The foreign material then had to be removed by expensive hand labor before importers would accept delivery.

Four of the six sides of a bale of rubber are uncovered and burlap patches are applied to ends. "On end" stowage utilizes the two burlap patches as built-in cargo separators. The burlap prevents fusion and contamination which formerly resulted from the use of their separators.

Marine insurers, importers and steamship lines all benefit from the new method of stowage. By preventing contamination, costly and time-consuming hand labor performed on the piers by gangs of public weighers is eliminated. Charges may range from $30. to $3000 for the cleaning of a 500 bale shipment, depending upon the severity of contamination. "On end" stowage also enables rubber importers to meet contractual delivery dates by doing away with delays and pier congestion while cargoes await cleaning. Finally, it saves steamship lines the cost of separator materials which they formerly had to buy for each voyage.

NOW YOU CAN LICK YOUR CARTON-CLOSING PROBLEMS

...with one hand tied behind you!

it's NEW!

International Clincher

the exclusive one-hand carton-closing stapler

Never before have you been able to close filled cartons with a hand stapler as quickly and easily as you will with the CLINCHER. The only truly one-hand stapler on the market, its unique lever action plus an effective spring-loaded lever return make staple driving effortless and positive. By close attention to balanced design, and by the elimination of all needlessly heavy castings, the CLINCHER is not only a practical one-hand operation, but also a faster, less fatiguing method of stapling.

LOADED WITH FEATURES THAT MAKE CARTON-CLOSING A CINCH!

- Easy penetration adjustment control for fast staple control, from a full clinch to a blind clinch.
- Positive staple-after-staple pusher tension.
- Universal magazine for ½", ⅝" and ¾" staples.
- Patented two-piece anvil.

You can take it apart and reassemble it in minutes with only a screwdriver ..., just 4 major assemblies for years of low-maintenance service.

MAIL COUPON FOR FREE DEMONSTRATION!

INTERNATIONAL Gold Crown CSM ISM

International Staplers

INTERNATIONAL STAPLE & MACHINE CO.

ORIGINATORS OF CARTON CLOSING STAPLERS

800 E. HERRIN STREET • HERRIN, ILLINOIS

International Staple & Machine Co.
800 E. Herrin St.
Herrin, Ill.

Sirs:

☐ Send illustrated literature on CLINCHER.

☐ Have representative call for demonstration.

Name_____

Address_____

City_____ Zone____ State_____

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MEDIUM-LOAD HANDLING . . .

(*Continued from page 69*)

What Makes a Good Low-Lift Truck?

Basically, your new truck wants to be rugged and sturdy, good for many miles. All-welded steel construction will give the longest life, and its design should be sound, with standardized, interchangeable parts for low cost maintenance. It will have few movable, wearing parts, and there will be no projecting pedals, levers or other "gadgets" to damage property or injure employees.

The pulling handle should be of a convenient length, and mounted at the proper height, so that the operator pulls forward, not up. It should also be spring-balanced, to keep it up out of the way, when not in use.

All of the wheels should be equipped with anti-friction bearings, either ball or roller.

Rear wheels on the skid models will vary in size, depending on the underclearance required for the particular skid being used. The largest possible diameter should be specified to take advantage of the added mobility of these large wheels.

Some models of pallet trucks are only suitable for use with single-faced pallets. If you have double-faced or both double-and single-faced pallets, you'll want to specify the truck than can be used with either type.

Selection of wheel material is an important item. For skid loadlifts, rubber cushion wheels are the most popular, as they are quiet, they protect the load, and they stand up well on most floors. You'll do better to use steel wheels, though, if your floors are in poor shape. Rubber cushion wheels can be used on pallet loadlifts in the 2,000-pound class, but rubber on the small rear wheels isn't very satisfactory with higher loadings. A first class phenolic plastic wheel does a good job here. In general, remember that poor floors are tough on rubber or plastic while a good floor can soon be ruined by a steel wheel.

The same features of heavy, all-steel, welded construction are desirable with these units, too. 8″ x 2″ roller bearing wheels are adequate for this outfit. The best "jack" design we've seen backs under the skid with the handle raised. As the handle is lowered to the pull position, the hook on the top of the jack engages the ring on the end of the skid, while the skid is lifted off the floor at the same time. It's all done in one motion, without any bending.

You are now almost ready to start moving things. But hold off just a bit. You were very careful to understand every feature of your new "middleweight" truck. As you put it to work for you, point these things out to the man or woman who is going to run it for you. A good workman appreciates and will care for a good tool. Be sure he knows its limitations as well as its strong points and together, as a team, they'll do a good job and—what's more important—a *safe* one for you.

FOR ECONOMY IN MATERIAL HANDLING STACKING AND SHIPPING...
BIGELOW-GARVEY
COLLAPSIBLE PALLET BOXES
Fill the Bill
The Hinged-Corner, Super-Strength B-G Pallet Boxes are made in 3 models: A—Plain, B—Open Front, and C—Drop Leaf...a complete line for all types of material handling. No matter what type of product you wish to store or ship, there's a B-G Container that will do the job for you with the greatest of safety, convenience and efficiency.
• ECONOMICAL IN FIRST COST
• CONVENIENT—EASILY STACKED
• COLLAPSIBLE FOR STORING
• STRONG—HANDLE UP TO 5000 lbs.
• REDUCE LABOR and HANDLING COST
• INDIVIDUALLY ENGINEERED
B-G Tight-Corner Pallet Boxes and Special Containers are designed to your specific requirements. Let us help solve your particular handling and shipping problems.
Backed by 33 Years of Special Packaging Experience
Tight Corner Hinge Crate
Wooden Pallets
Model A Pallet Boxes
Model B Pallet Boxes
Model C Pallet Boxes
Kraft Crate
Wooden Boxes
Six Section Panel Crates
MILLS: ARKANSAS GEORGIA WISCONSIN MINNESOTA KENTUCKY
always check
B G
General Office
Write for complete details and prices to...
BIGELOW-GARVEY
and Laboratory
lumber company
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Phone WHitehall 4-5252
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the fastest gummed tape
human hands can use

blue ribbon

with Super Speed Renacel. With Blue Ribbon in your shipping room, everything happens *fast*—activation... sealing... bonding. It flows from the dispenser smooth and supple as silk... whips around cartons like lightning... adheres tenaciously no matter how long cartons are stored. Package production rises swiftly; costs come down. And all this happens even if you seal with ice water and in refrigerated rooms. Blue Ribbon is odorless too, a convenience your personnel and customers will appreciate.

Blue Ribbon is coated with Super Renacel, the adhesive that brings unparalleled efficiency to your sealing operation. For a FREE TEST SAMPLE of *Blue Ribbon* gummed sealing tape with *Super Speed Renacel*, write on your letterhead to Dept. F-71.

HUDSON PULP & PAPER CORP.

477 Madison Avenue, New York 22, N. Y.

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BOTTLENECK

in your shipping room?

Take a walk through your shipping department and see "what cooks". Are you paying for TIME that is wasted in fussing with obsolete tape dispensing equipment that jams, doesn't wet properly, ejects erratic lengths . . . is a general bottleneck in your shipping department?

Look to Seal-O-Matic for the most dependable Tape Dispensers and Moisteners . . . a model for every need—for every use—light or heavy duty — full quality at half the expected price. Unconditionally guaranteed for TWO years!

A TYPICAL VALUE—The Senior 3"—only tape machine for less than $75 dispensing up to 36" in one stroke! Automatically measures, moistens, cuts, ejects and dispenses the exact length. Only $49.95.

SPECIAL . . . Model 55 for heavy, reinforced tapes — only $55.95. Other Models from $3.50 up.

(Prices slightly higher West of Rockies)

Write for Catalog and Free Booklet, "How to Adapt Your Shipping Department for Two-Strip Sealing."

Write for 10 day FREE trial offer!

Seal-O-matic DISPENSER CORPORATION

Dept. F-I, 169 Murray Street • Newark 5, N. J.

Our 22nd Year! Formerly Lipton Manufacturing Co.

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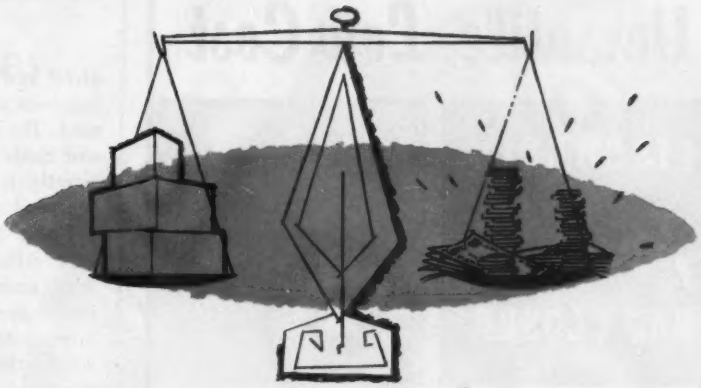
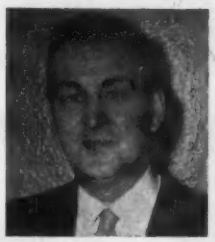


How the Air Force Evaluates

METHODS OF DETERMINING PACKAGING COSTS

by George J. Penick

Chief, Special Audits
Projects Division
Eastern District
Auditor General, USAF



A recent survey of 50 Air Force prime contractors provided important information on their accounting and pricing procedures on packaging. At the Joint Military-Industry Packaging and Material Handling Symposium held recently in Washington, George J. Penick discussed Air Force views on packaging cost determination. This paper summarizes the many methods used by prime contractors and tells how the Air Force evaluates them.

PACKAGING expenditures of the Air Force exceed $500,000,000 annually.

With expenditures of this magnitude, a planned program of administration and control is vital. To facilitate such a program, the Air Force has established a packaging objective which, basically, is: **Maintain maximum serviceability of materials throughout the supply system at minimum cost. Or, get an adequate package at the lowest possible cost.** Incident to the attainment of this objective is a knowledge of what constitutes packaging cost. We know that cost is a composite of numerous elements—direct and indirect, fixed and variable, probable and theoretical.

We recently surveyed 50 Air Force prime contractors and discovered wide variations in accounting and pricing procedures on packaging. The survey revealed that there are variations even among divisions of the same company. It proved that no two cost determination procedures are identical.

Information gathered in the survey also furnished us with some answers to the question: "Can packaging costs be segregated?" The answer, judging from actual practice, would have to be "yes and no". In the cases where the answer is "yes", segregation of packaging costs in accounting records is handled in a variety of ways and with definite limitations.

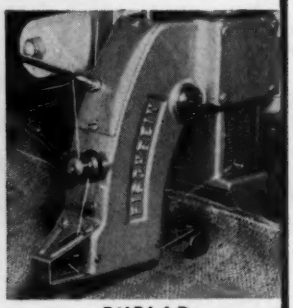
Generally, the accounting treatment for packaging cost falls within one of four groupings: Method 1—direct charges to individual units plus allocation of overhead; Method 2—direct charges to contracts plus allocation of overhead; Method 3—accumulation in separate packaging expense pool; Method 4—accumulation in regular overhead.

The first two methods constitute a combination of

(More on next page)

Versatile, Low Cost

FISCHBEIN *Portable* BAG CLOSER

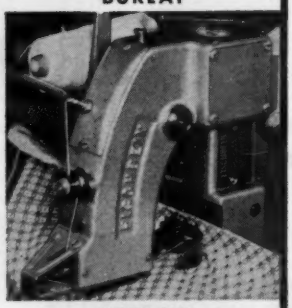


BURLAP

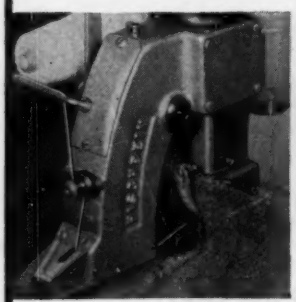
Handles All Varieties of Bags!

•

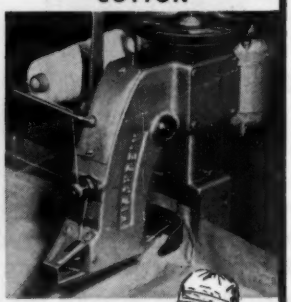
Total Weight only 10½ lbs.



COTTON



HEAVY JUTE & SISAL



PAPER

- No installation necessary . . . . plug into any outlet.
- Closes average 100 lb. bag in less than 6 seconds.
- Simple to operate and maintain.
- Can be suspended for stationary use.
- Lowest priced bag closer on market.

Fully Guaranteed!

FOR DETAILS, MAIL THIS COUPON NOW

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Firm Name_____

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PACKAGING COSTS

Continued

direct and indirect charges. Method 1, where packaging costs are segregated by individual units, is seldom used. The majority of the contractors follow the second method, charging a portion of packaging costs directly to contracts and treating the remainder as overhead and/or pro-ratable packaging expense.

Under both Method 1 and Method 2, there are wide differences as to the class, nature and limitations under which packaging costs are charged directly. Some contractors charge only packaging labor direct, some packaging material and some charge both. Where this is done, the direct charges are usually classified as regular direct labor, or regular direct material and thereby lose their identity in the accounting records as packaging costs. This is an important point to bear in mind when attempting to determine unit or contract packaging costs.

There are also inconsistencies among contractors as to the nature of packaging labor and material that are charged directly. For example, some contractors classify only crating labor as direct labor. There are others who classify only special packaging labor as direct labor. Material, such as lumber, containers and preservatives are charged directly in some cases and in other cases the very same items are treated as indirect material.

As to the limitations under which charges are made directly, the variations are numerous. With some of the contractors, for example, direct charges are limited only to:

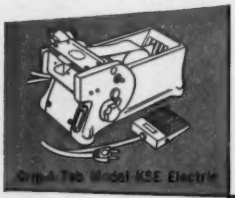
a. Cost of Government specified packaging where it exceeds standard commercial requirements.
b. Subcontracted packaging.
c. Packaging on CPFF contracts.
d. End items and not spares.
e. Spare parts and not end items.
f. Major spare parts as distinguished from minor spares and end items.

In addition to the direct charges discussed above, there is, of course, an allocation to the unit or contract for packaging costs which are classified as indirect expenses, as well as for other fixed and variable overhead expenses. These allocations are made in a variety of ways, sometimes depending on the manner in which the direct charge is classified.

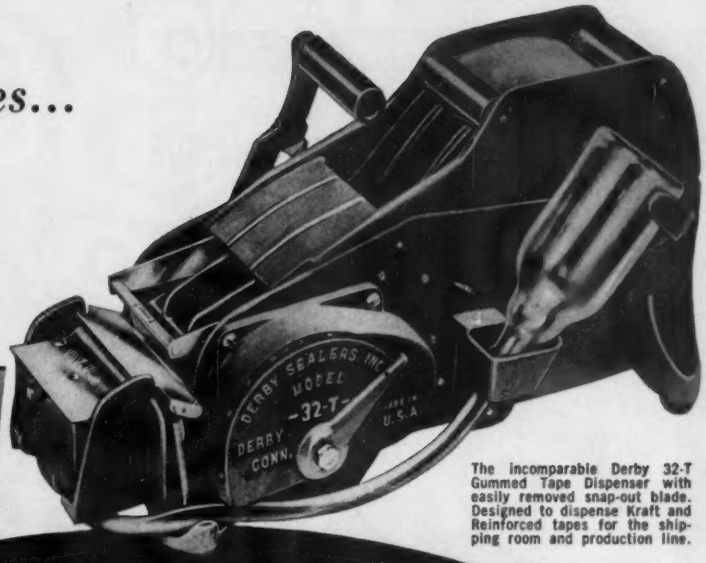
Contractors using Method 3 place all packaging costs in a separate expense pool. Usually, where this is done, the pool includes other expenses, such as: receiving, handling, storing and shipping. The expenses of this tool are usually liquidated on the basis of percentage of cost of shop order or shipment. Sometimes this percentage varies, according to kind of package or destination of shipment. Sometimes only material cost is used as the basis for distributing this expense pool. In other cases, tare weights are used with adjustment factors to compensate for special packaging. Regardless of the basis of allocation, these percentages, which are applied on an overall basis, will not reflect packaging costs for individual units.

(Continued on page 144)

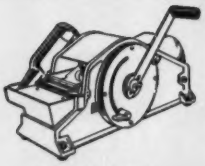
2 Great Names...

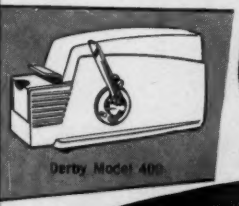

Grip-A-Tab Model KSE Electric

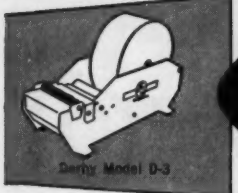
Grip-A-Tab Bag Sealer



The incomparable Derby 32-T Gummed Tape Dispenser with easily removed snap-out blade. Designed to dispense Kraft and Reinforced tapes for the shipping room and production line.


Derby Model 152

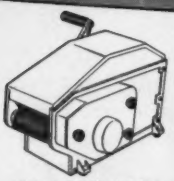

Derby Model 400

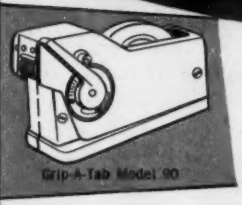

Derby Model D-3

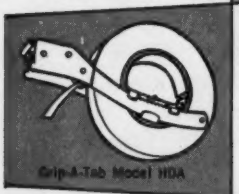
DERBY and GRIP-A-TAB

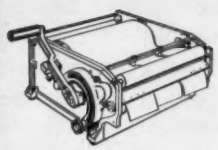
(GUMMED) (PRESSURE SENSITIVE)

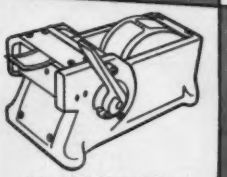
TAPE DISPENSERS

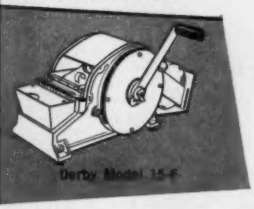

Grip-A-Tab Model 802


Grip-A-Tab Model 90


Grip-A-Tab Model HDA


Derby Model BW-12


Grip-A-Tab Model KS-3


Derby Model 15-F

Over 60 JOB DESIGNED* Models

Here are just a few of the outstanding models in the famous Derby Sealers and Grip-A-Tab lines of fine tape dispensers and applicators. For office, production line and shipping room... for every packaging counter... for any operation where gummed or pressure sensitive tapes or roll labels are used, there's a Derby *Job-Designed dispenser that will do the job better, quicker and more economically!

Mail Coupon For Further Information and 7-DAY FREE TRIAL OFFER!
Derby Sealers, Inc., Dept. M, Derby, Connecticut

Gentlemen:

I would like a 7-Day Free Trial on Model_____Tape Dispenser.

Please deliver to:

Name_____

Address_____

City_____ **Zone**_____ **State**_____

Please send literature on Model (s)_____ **dispenser (s)**

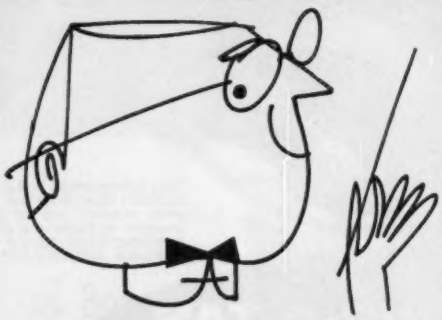
***JOB-DESIGNED** ... Every Derby and Grip-A-Tab Tape Dispenser is scientifically designed to perform specific sealing, wrapping, holding, palletizing or pre-packaging operations. There is a Derby or Grip-A-Tab Tape Dispenser to solve your packaging problems.

"IT PAYS TO STICK WITH DERBY"

DERBY SEALERS, INC. DERBY, CONNECTICUT

Circle No. 113 on Reader Service Card for more information

better stencil ink



IDEAL users know that a better stencil ink can make a lot of difference.

IDEAL ink, for instance, saves time because it is fast-drying . . . and it gives clean, clearly-defined markings.

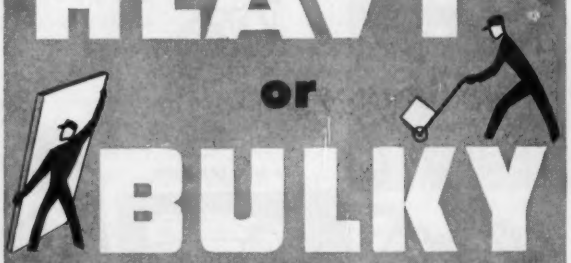
The special IDEAL formula prevents excessive settling in the bottom of the can . . . and that cuts waste.

So, if you are not already using IDEAL stencil ink . . . try it and see why so many others are.

IDEAL
STENCIL MACHINE CO.
BELLEVILLE, ILLINOIS

Circle 43 on Reader Service Card for more information

If your product is HEAVY or BULKY



Package it for less with
TAPE-STRAP®
gummed filament tape

Users report savings up to 50 and 60 percent when they switch to super-strong Tape-Strap for package reinforcement. In many instances, Tape-Strap's amazing strength makes it possible to change from a wooden crate to a paperboard container; and *every* Tape-Strap user not only cuts down application time as well as other packaging costs, but achieves better packaging.

Tape-Strap is as easy to handle as ordinary gummed sealing tape. It's economical, because only a few short strips are needed. Tape-Strap goes on without pressure, can't cut the container or damage contents. No costly application equipment is needed. And there's no disposal problem.

60% saving!

Wolverine Bolt Company, Detroit, switched to Tape-Strap for reinforcing Belsinger cartons holding an average of 300 lbs. of bolts or upset products. Labor cost per carton dropped 60%.

FREE SAMPLE ROLL

Try out Tape-Strap in your own shipping room. Write for free sample roll and complete data, including application diagrams for various types of containers. Compare the cost with any other type of reinforcement.

MID-STATES Gummed Paper Company

Dept. 118, 6850 S. HARLEM, BEDFORD PARK, ILL., ARGO P. O.

New York Syracuse Philadelphia Boston Atlanta
Cleveland Detroit St. Louis Los Angeles

Circle 108 on Reader Service Card for more information

MAINTENANCE NOTEBOOK . . .

(*Continued from page 72*)

the most positive and trustworthy results and which is practicable.

CORRECTIVE ADJUSTMENTS AND REPAIRS

Inspectors should work from a planned check list covering all points of wear on the conveyor, with appropriate columns to report results of these points as "okay" or as requiring:

1. Additional or supplemental lubrication.

2. Immediate emergency repair.

3. Short term repair.

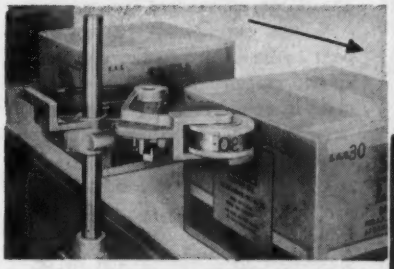
4. Attention during a general overhaul.

This is the point at which the training, experience and good judgment of the inspector is of prime importance. Outside of detecting the need for immediate action from these reports, changes can be made in the lubricating schedule and adjustments, repairs or replacements can be scheduled

Circle No. 150 on Reader Service Card for more information

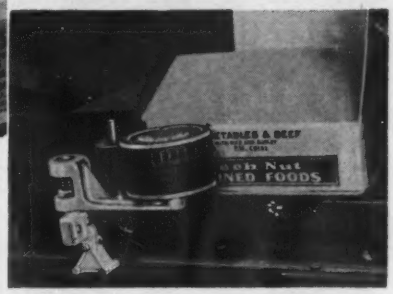
Low-cost marking attachment pays for itself in weeks... saves thousands of $ every year

Imprints 1, 2 or 4 Sides of Cases in Single Pass.



◀ ROLACODER twin-action markers ... for imprinting codes and lot numbers on 2 or 4 sides of cases simultaneously ... without requiring cases to be turned.

Friction-driven ROLACODER markers do your marking automatically . . . save cost of manual stencilling or stamping. Designed for easy do-it-yourself installation on existing conveyor lines, case-sealers, etc. They use quick-change rubber type or dies, hold 8-hour ink supply. Write for descriptive literature.



▲ ROLACODER single-side marker for accurate spot imprinting of brand names, varieties, code-dates, lot numbers on cases, cartons, fibre drums, bags, etc.

Gottscho

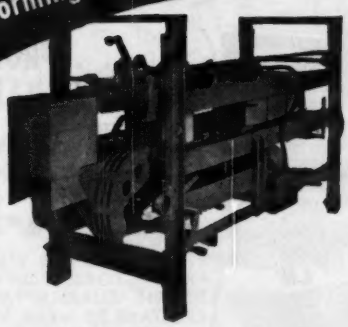
ADOLPH GOTTSCHO, INC.

Dept. D, Hillside 5, N.J.

In Canada: **RICHARDSON AGENCIES, LTD., Toronto & Montreal**

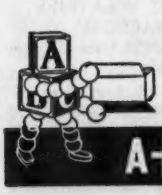
Automatic **CODING, MARKING, IMPRINTING MACHINES**

A shorter, narrower, simpler, and better performing case sealer



THE NEW A-B-C *Junior* CASE SEALER

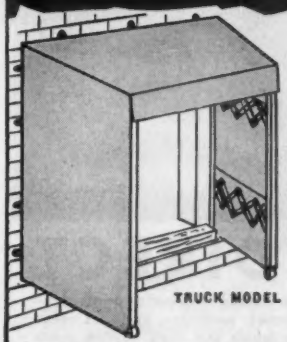
The A-B-C Junior Case Sealer automatically seals corrugated shipping containers in only a fraction of the floor space ordinarily required. Operation is fast—trouble free—economical. A completely new flight chain construction virtually eliminates carton jamming . . . Three semi-automatic models are available to fit most case sizes. Write today for details and floor plans.



A-B-C PACKAGING MACHINE CORP. TARPON SPRINGS, FLORIDA

Circle 130 on Reader Service Card for more information

Tunnels for Safety



DAZZO DOCK SHELTERS

Provides a foldable tunnelled passageway between building door and truck or freight car door.

Protects your loading dock loaders and merchandise against rain, sleet, snow or driving winds.

Eliminates accidents and loss of traction, due to wet and slippery conditions.

Protects against changes in temperatures when doors are opened for loading.

TRUCK MODEL

DAZZO PORTABLE FREIGHT CAR DOOR RAIN GUTTERS

Prevents rain or melting snow from sliding off car roof onto door opening . . . thereby avoiding wet and slippery dock boards.

Models for all types of cars

Write for literature... specify your requirements to Dept. F

*Pat. Pend.

DAZZO PRODUCTS CO.

152 Bleecker Street • New York 12, N.Y.

Circle 23 on Reader Service Card for more information

Circle No. 158 on Reader Service Card

opens any box car door with the famous NOLAN One-Man Car Door Opener!

ONLY $39.50 EACH

F.O.B. NOLAN CO., BOWERSTON, OHIO

The 1957 model Nolan One-Man Car Door Opener easily multiplies one man's strength a hundred-fold and more! Opens the most cantankerous box car door with little effort in 20 seconds or less, without danger to life or limb! Save time and money with the Nolan!

Send Coupon Now!

THE NOLAN COMPANY
110 Pennsylvania Street, Bowerston, Ohio

Please send ☐ ONE-MAN CAR DOOR OPENER at $39.50
☐ FREE LITERATURE

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE____

MAINTENANCE NOTEBOOK

Continued

ahead for convenient times.

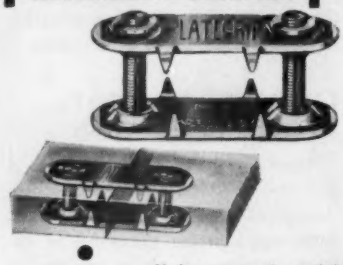
Where emergency repairs appear to be in order, the inspector should consult with the plant official in charge to arrange for prompt service to prevent a longer and more costly shutdown.

Defective trolleys, for example, are often the cause of major breakdowns. They are usually the sign of hidden mechanical or operating troubles which in time could cause serious difficulty. Besides the excessive wear and corrosion caused by lack of adequate lubrication, trolleys are often damaged from other causes.

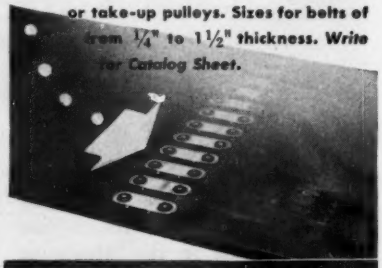
Unbalanced loads on the carriers tend to throw the entire weight of the load on one wheel of the trolley, pulling it against the lower flange of the rail, while the unloaded wheel presses the upper flange. Excessive wear on trolleys and track is the result. The correction is to design carriers

Circle No. 159 on Reader Service Card

PLATEGRIP
PLATE FASTENERS FOR CONVEYOR BELTS



- Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. *Write for Catalog Sheet.*



ARMSTRONG BRAY & CO.
5396 Northwest Highway, CHICAGO 30, U. S. A.

The Quick . . Accurate Way to Address Shipping Cartons

PRINT DIRECT

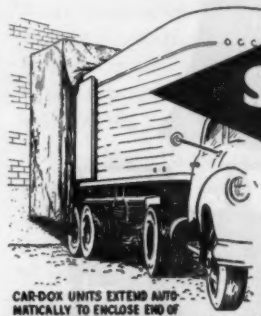
The MULTISTAMP Hand Stamp Stencil Duplicator prints shipping data direct on cartons, boxes, packages, and eliminates double operation of preparing labels and then pasting them on the containers. Handy as a rubber stamp . . . fully portable, non-mechanical, no moving parts to wear. Get 1,000 or more clear sharp impressions from one typewritten inexpensive stencil without re-inking. In photo above, shipper's name, address and "Ship To" label frame were preprinted by carton manufacturer.

THE ORIGINAL HAND STAMP STENCIL DUPLICATOR

OVER 35 YEARS

Model 1A shown in use above, complete outfit with supplies in sturdy case, $12.50. No. 3 Postcard and Large Tag Size outfit shown at right $19.50. Others, $9.50 to $99.50, F. O. B. Norfolk, Va. At office or shipping room supply dealers, or write for catalog, sample stencils and imprint.

MULTISTAMP
STENCIL DUPLICATOR



FOR SAFER DOCKS...

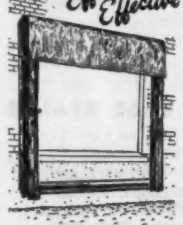
. . . PROTECT THEM FROM RAIN, SNOW AND ICE *with*

CAR-DOX UNITS EXTEND AUTOMATICALLY TO ENCLOSE END OF TRUCK. FRONT CURTAINS (TOP AND SIDE) ADJUST QUICKLY TO PROVIDE FULL PROTECTION.

FROMMELT TRUCK OR RAIL

CAR-DOX

Practical Efficient Effective



UNIT RETRACTS EASILY AND COMPACTLY—AND IS REABILY SECURED CLOSE TO FRAME.

RETRACTABLE ALL-WEATHER DOCK PROTECTORS. CONSTRUCTED OF TOUGH, DURABLE FABRIC (HIGHLY RESISTANT TO WEAR, WATER, MILDEW AND FIRE) FITTED OVER HEAVY GAUGE STEEL RETRACTABLE FRAMES—CAN BE POSITIONED (EXTENDED OR RETRACTED) BY ONE MAN IN A MATTER OF MINUTES.

SPEEDS LOADING and UNLOADING in INCLEMENT WEATHER.
REDUCES ACCIDENT FACTORS.
PROTECTS MERCHANDISE from LOSS or DAMAGE by WEATHER.

Meets Requirements of U.S. Dept. of Agr.
UL Approved

For detailed information and prices, write

FROMMELT Industries—BOX 165 · DUBUQUE, IOWA

FABRICATORS OF APPROVED SAFETY PRODUCTS

Circle 67 on Reader Service Card for more information

Circle 103 on Reader Service Card for more information

which will distribute the load properly or to see that more care is taken in loading the existing carriers.

Bulky loads carried on a single trolley are hard to control because of their size and balance. They tend to twist, and unless the chain and carrier bolts are very tight, will continue to twist back and forth, causing the trolley wheel to gouge the web of the conveyor track. The best protection against this is properly tensioned chain or the use of a load bar suspension. Sometimes such wear can be arrested by painting the rail with a tacky grease.

Bent trolley side arms and attachments are a frequent source of excessive wear. This trouble is difficult to spot because the load tends to hang perpendicularly even though the trolley arm is bent. These should always be replaced at once.

Correct chain tension (just sufficient to keep the chain away from the drive) should be maintained at all times. Too much slack causes bent trolleys, track wear, bent links, surging or pulsating, and even broken chain where the slack is sufficient to permit the pin to fall out of the link. When chain is too tight, an excessive strain is placed on turn components and on the chain itself, adding friction and causing chain wear.

Damaged links are often the signal that the chain is too loose, sprockets are out of line, that there are interferences in the conveyor path. Damaged links should always be replaced as soon as they are located, as they are a continual source of trouble.

While visual inspection can usually determine whether the chain is properly lubricated, it is advisable to loosen it occasionally to check the condition of the chain pins for wear, as well as the inside of the male link ends. Properly recorded, this will be a guide for the scheduling of replacements due to wear and will assist in preventing breakdowns.

The appropriate chain pull for each conveyor should be known and checked periodically. This is a valuable method for determining

Circle 1 on Reader Service Card

LIKE MONEY IN THE BANK...

THE economy of Acme's STA-FAST Pallets is like money in the bank. They'll *outlast* and *outperform* all other wood pallets because they're America's *strongest* wood pallets . . . designed to *overcome* the causes of pallet failure.

Sure, they cost a few cents more than ordinary ones . . . but they're the essence of sound economy since they'll *last far longer, require far less maintenance.*

When you send your specifications for a quotation you'll have the answer before you. *Send those "specs" now.*

ACME PALLET CO., Inc.
19 Park Row ● New York 38, N.Y.

BETTER MARKING EQUIPMENT
by industrial

FOR PRODUCTION LINE MARKING, DATING AND CODING

Industrial Marking Equipment is engineered to lower your costs — raise your operating standards. It is unmatched for high speed performance, and economical, efficient operation.

Before you make any decision on marking equipment, get full information on Industrial—you'll be glad you did!

Write for the new Industrial catalog —today. Dept. F.

multiwall bags
packages
cartons
containers
drums
shooks
pails
rolls
cans
etc.

Multi-Wall Bag Printer

ime INDUSTRIAL MARKING EQUIPMENT company, inc.
454 BALTIC STREET BROOKLYN 17, N.Y. Main 4-7601

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CUT COSTS for Packing BAGS

FILL and WEIGH with

CODDINGTON AUGER-MATIC Bag Packer

Low Cost, portable AUGER-MATIC packs any material from powder to pellets in paper bags . . . shuts off automatically when desired weight is reached.

Valve bags fit snugly on AUGER-MATIC spout so no dust escapes . . . keeps bags clean . . . eliminates costly tieing or bag closing equipment.

---------FILL OUT AND MAIL TODAY.---------

E. D. CODDINGTON MFG. CO.
5080 N. 37th Street, Milwaukee 9, Wisconsin

Please send me facts on Cutting Valve Bag Packing Costs

MY NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE.....STATE.....

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36,000 lb.

Shown here is the Model 38M Dempster - Dumpster handling two types of containers. Above a standard 15 cu. yd. bottom dumping container. At left and below a 10 cu. yd. Tilt dumping container in pick-up, haul and dumping positions.

Payloads Lifted, Hauled and Dumped by One Man and the DEMPSTER-DUMPSTER

TO ELIMINATE WASTE in time, labor and the expense of double-handling heavy salvable materials, this Dempster-Dumpster, installed in one of the nation's leading industrial plants, lifts, hauls and discharges 18-ton payloads with only one man, the driver.

Such heavy load requirements, of course, are the exception. But the important factor in the tremendous savings of the Dempster-Dumpster System is not capacity. It is the ability of only one truck-mounted Dempster-Dumpster, constantly on the move, serving many containers of various types and sizes, standard or special, built to meet the requirements of any plant.

Our records of hundreds of installations in plants of almost every known classification, show savings of from 60 to 90 per cent over previous methods. Moving materials from one point to another swiftly, economically, is a problem in every industrial plant in the nation. Most of these plants need the Dempster-Dumpster System.

Whether it's liquids, acids, rubbish, salvable, raw, finished, light, heavy or high temperature materials, there's a Dempster-Dumpster and containers, of 2 to 21 cu. yds. capacity, built to handle it. And all with only one man, the driver.

Can the Dempster-Dumpster System be used profitably in your plant? Let one of our engineers discuss it with you. *Dempster Brothers, Inc. . . . serving all industry throughout the nation.*

One Truck-Mounted
Dempster-Dumpster Handles Scores
of Containers... All Designs... All Sizes

6168

DEMPSTER BROTHERS, 617 Shea Bldg., Knoxville 17, Tenn.

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KEYED TO PRODUCTION!

SILENT HOIST LIFTRUK

3-5-6-7½-8
10-12-15
Ton Capacities
FLUID DRIVE
POWER STEERING

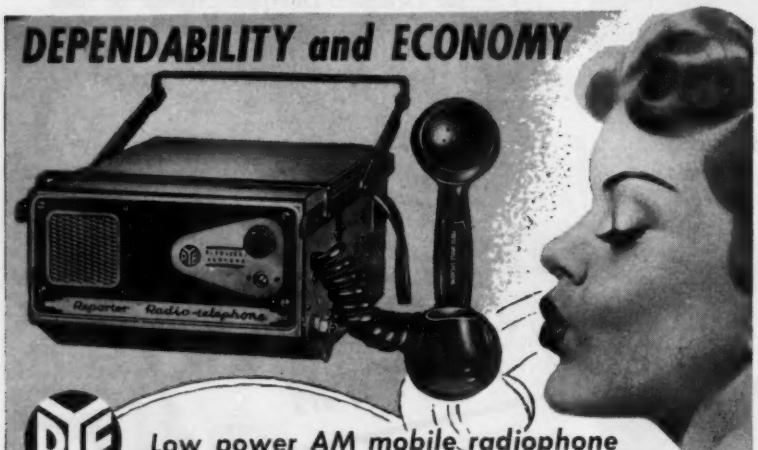
"72 frames per load . . . three lifts every four minutes . . . proves our needs for additional LIFTRUKS"

The SILENT HOIST Heavy-Duty Fork LIFTRUK so rapidly stepped up the production and movement of material, over past handling methods, that this Plant Manager (quoted above), was equally quick to anticipate *fleet* LIFTRUK operations in their plant. *Another example that LIFTRUK pays its way!*

Can we aid in solving your problems? Send for Bulletin #77.

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
888 63rd Street, Brooklyn 20, N. Y.

DEPENDABILITY and ECONOMY



PYE

Low power AM mobile radiophone

..."reporter"

Ideal for use in all types of vehicles in the Material Handling field where radio communication is advantageous.

Effective communication at maximum economy. Highly efficient noise limiting, nearly *MAINTENANCE-FREE* operation, easy alignment, minimum battery drain—no alternator or H.D. generator necessary— has transmitter "filament off" switch. Mounts easily under dash board without special tools.

Frequency Range: PTC 117 covers 118-132 and 144-174 mcs.
Input Voltages: 6 or 12. Also 24 VDC or 117 VAC optional extra.
Transmitter Power Output: 1 to 1½ watts over frequency ranges.

PRICE: $349.00 complete F.O.B. New York City

A few exclusive territories for experienced mobile radio communication distributors still open.

Literature on Request

PYE CORPORATION OF AMERICA
Telecommunications Division
270 Park Avenue, New York 17, N. Y.

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MAINTENANCE NOTEBOOK

Continued

coming trouble. If chain pull has increased since the last check, it could mean lack of proper lubrication, roller or traction wheels not turning freely, bent trolleys, hard rolling trolleys, excessive loads or, in the case of multiple drive units, one unit may be bearing more than its share of the load.

Chain pull tests may be made electrically or by a dynamometer. The latter is the most accurate and reliable and can be made in a few minutes with the proper equipment. The chain pull test is one of the inspector's most important duties and should be made at regular intervals as part of the planned maintenance program.

The importance of maintaining complete and accurate records has been demonstrated in the foregoing remarks. It is from these records that the "experience" factor can best be determined, repairs and replacements scheduled at convenient times in advance of the development of breakdowns. Such records also will aid in determining the quantity and type of parts which should be kept on hand or ordered in advance of a major repair job so that non-availability of material and parts will not prolong a breakdown and prevent necessary repairs during a shutdown period. Conversely, these records can also be used to avoid the stocking of parts which are not required, thus helping reduce dead or slow-moving inventory.

A program set up along the foregoing general lines will pay the operator of conveyors high dividends.

FOUNDATION . . .

(*Continued from page 83*)

modity classification and frequency of demand. The items are arranged in the same sequence as they appear on the order forms sent in by store managers. This avoids back-tracking and makes it possible for order selectors to move in one direction as they gather items one by one.

The volume of incoming goods from rail cars is augmented by a constant stream from trailer trucks, numerous smaller trucks and direct-from-farm produce. At the same time, a constant outmovement is in progress.

Outgoing shipments are controlled by a punch card tabulating system which provides continuous inventory control. Store invoices are prepared from punch cards, and are used as guides in the selection of the commodities ordered. Each of these invoices, representing a grocery order, is taken by a selector who chooses the items in sequence from the list and places them on a 4-wheel truck. After loading the last item on his list, the selector hooks the truck to the electrically-driven tow chain which circles the selection area. The truck is marked with numbers which indicate (1) that the order has been completely assembled, or that more items are on another truck, (2) to which store it is going, (3) at which point the 4-wheel truck is to be detached from the tow chain, and (4) on which delivery truck it is to be loaded.

As the truck approaches the shipping section, a checker tallies the order to make sure the correct items have been selected. The order cannot be loaded without the checker's okay.

This efficient system has proved adequate to the demand of 136 hungry stores in the First National chain. But speedy, uninterrupted flow is a "must" to keep on schedule. The absorption process floor has contributed solidly to the success of the operations since the center was opened, and it is confidently expected to prove adequate to the demand of future expansion.

AGAIN it's USP
PALLETAINERS

Fish Baskets Saving Port Handling Costs

BY CAPTAIN BARNACLE

A tisket, a tasket.
The fish are in the basket.

More than $100,000 worth of baskets, if you please, for fish in cold storage at Seattle's Spokane St. Warehouse.

And fish in the basket mean cash in the pocket for taxpayers who, through the Port of Seattle, own the Spokane St. Warehouse.

The past year, the Port sunk $64,000 in 1,400 galvanized wire baskets to house the salmon and smelt, cod and shellfish that inhabit frigid haunts of the cold storage terminal.

What's more, the Port is so pleased with the savings its baskets have helped it gather in the past year that it probably will spend as much more in 1956 to "basketize" its whole fish storage operation.

KING-SIZE DUE

Up till now, the Port hasn't been able to use baskets for the halibut. Many halibut are too big. But some king-size baskets are planned for the big fish [illegible] three separate may're [illegible]

THOUSANDS OF DOLLARS

That manhandling, spread out over the thousands of tons of fish that move in and out of the warehouse each year, represents the thousands of dollars the Port hopes to save.

The baskets can be piled three-high for storage or shifting via liftrucks. Out of use, they're collapsible and don't take much space.

Cold storage has been a Port headache for years. Port Commissioners think they've found a way to help pull it out of the red.

It's not in the bag, but Commissioners hope it's in the basket.

Fish don't leave the bask[illegible] [illegible]the time they mu[illegible] out [illegible]—for the halibut or otherwise?

The answer is, to save cash. Port general manager Howard M. Burke is cautious about predicting future bonanzas, but he admits the Port thinks the baskets may save it $20,000 a year in handling costs.

Again...proof positive of dollar savings you can expect when you use USP Palletainers. Proof that Palletainers are the most versatile materials handling containers available to any industry.

Then, too, Palletainers are available in a wider range of sizes, types and capacities to match each need. Why not prove just how much Palletainers can save in your plant. Survey your handling, your transport and shipping, consider visual inventory and storage operations. See how many places Palletainers can save dollars and man-hours.

Palletainers have revolutionized the handling of frozen fish as well as many other food products. Palletainers stack safely with contents always visible—always safe.

Palletainers are used for dip-freezing operation. Entire container and contents then placed in freeze room—ready for processing or shipment.

USP

UNION STEEL PRODUCTS CO.
ALBION, MICHIGAN

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CONTAINER DESIGN . . .

(*Continued from page* 63)

to adhere to the two principles relating to point of use and overall size to meet the specifications required when shipping by rail cars and highway trucks. The end-bearing crate, for example, was designed with a drop-side feature for ease in unloading at the work place. However, due to net weights, the crate dimensions had to be limited to 40 by 40 inches which, while satisfactory for highway shipments, created lost space in rail shipments. Fortunately, both types of containers could be stacked, which afforded full utilization of the cubic storage capacity in the plant.

As in the example of the handling of motor laminations, it again can be emphasized that by holding to the basic principles, the final solution will be a sound and an economical one. In reviewing the new system of handling incoming castings, it can be seen that the system is economical to operate, does not require additional equipment and it released approximately 550 containers of the previous type for in-plant use.

Economics of Containers. The economics of container design and and the overall investment required to apply the design are important factors in material handling. The following three principles aid in controlling container costs and the operating costs of the container handling systems:

7. *Unit loads should be increased to an economic maximum.*

8. *Inventory of containers should be kept to a planned minimum.*

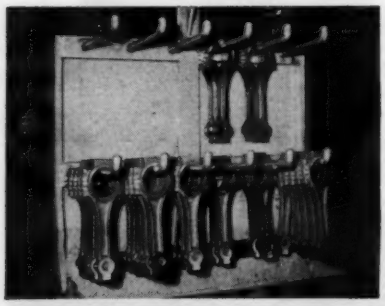
9. *Minimum materials with maximum strength should be used in container construction.*

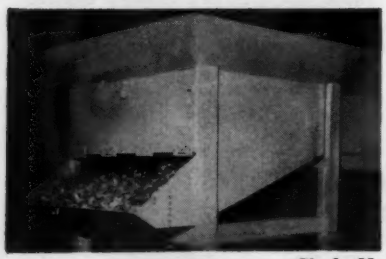
When the unit cost of the tub, collapsible wire container, pallet, pan and rack was studied with respect to overall plant inventories, the total investment relative to various handling systems became apparent. For example, it was first suggested that special wire containers, which were already in use, be used to handle some bulky parts. Although bulky, these parts could nest and stack within each other.

Therefore, a study of the economics involved in the use of a special container versus a system of standard wooden pallets and pallet racks was undertaken. Results of the study showed that the projected investment in containers would be three times greater than that for wooden pallets and racks for the same number of parts.

Another example of container economics in applying the first principle listed above can be shown in the use of the same wire container. The part to be handled was a 22-inch-diameter dome for a home heating furnace. It was clear from a cost standpoint that the existing 42 by 36 by 24 inch wire containers could not handle these parts economically; therefore, a special 68 by 46 by 30 inch container was designed.

The ensuing design increased the unit load over the former system used, but not enough to justify the unit cost of the proposed container. The answer lay in in-





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Call on Lanco to help solve your production problems with "Custom Engineered" materials handling equipment. Experienced engineers will analyze your problem and design the needed equipment, or Lanco will produce the equipment from your designs.

Samples are submitted for on-the-job trials prior to acceptance. Lanco's adequate stocks and production facilities insure early delivery. Delivery dates are quoted and your order delivered to your plant at the time you specify. Call a Lanco representative to lick your production bottlenecks. He will be glad to discuss your problem with you and submit designs, delivery dates and costs.

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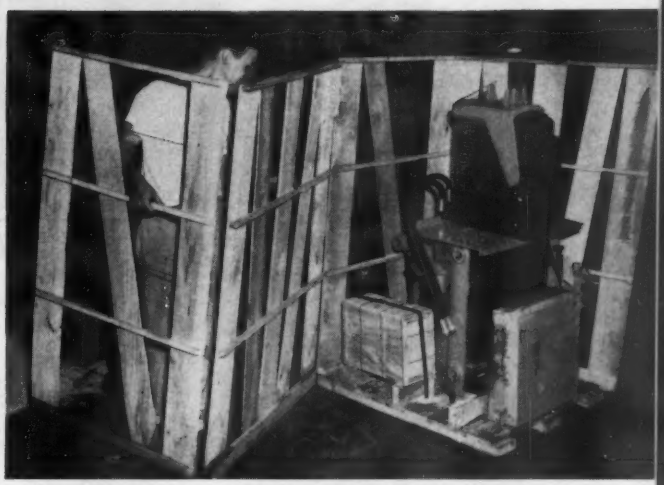
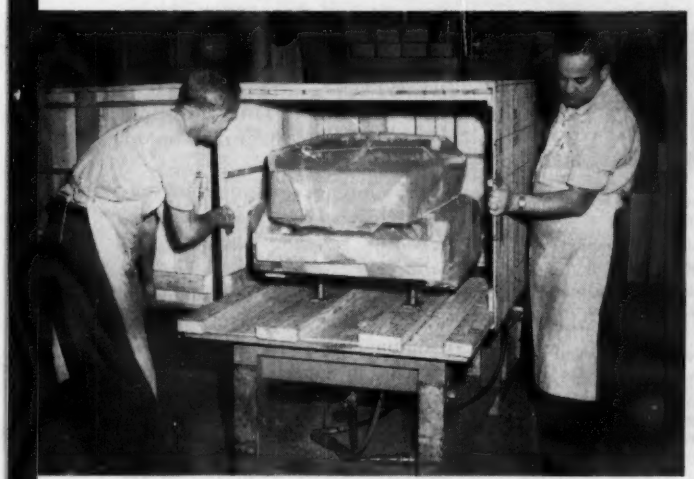
PACKING NEWS FROM WIREBOUND

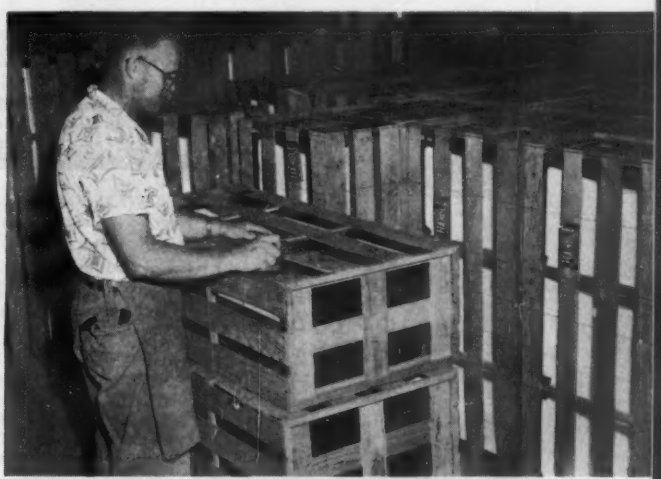
Corn Shellers Get Shell. Now, a Wirebound pack provides a protective export shell for two corn shellers. By bolting one to the top and the other to the bottom of the Wirebound, interior packing is eliminated and packing time reduced from 1½ hours to 48 minutes. Gross shipping weight is cut from 353 pounds to 319 pounds; packing cost reduced by 41%.



Wirebound Provides "All-In-One" Pack For Diesel Tractor Attachment Assembly. A multiple part tank assembly for a heavy duty model power digger attachment for a diesel tractor ships all in one compact Wirebound crate. And this Wirebound container accounts for only 154 of the 1307 pounds of gross shipping weight as well.



Accounting Machine Gets Money Saving Protection. An intricate and delicate accounting machine mounted on rubber shock mounts and dust-protected with plastic bag wrappers is solidly enclosed by a Wirebound Box for maximum protection in domestic or export shipment. All four models of this machine pack with equal safety in this one container thus saving time, labor and over-all shipping cost.



4 Minute Packaging For Porcelain Enameled Bathtubs. Enameled steel bathtubs for mobile homes are now packed in only four man-minutes. This fast work allows big economies in packing costs, yet the Wirebound crates that do the job provide the finest protection possible for the fragile product. The Wirebounds also allow easy inspection at all times and simple fall-away unpacking.

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WIREBOUND BOX MANUFACTURERS ASSOCIATION

Room 1171, 327 S. La Salle St., Chicago 4, Ill.

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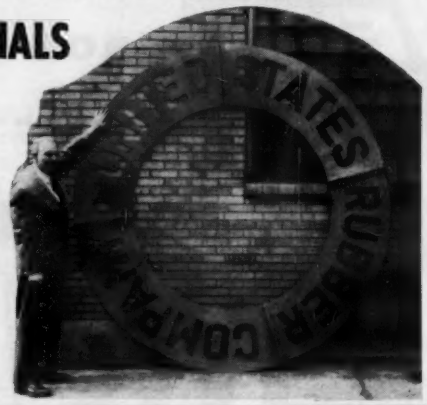

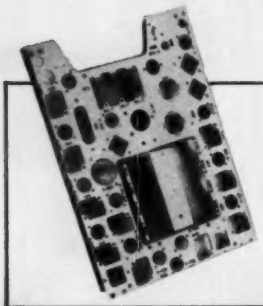

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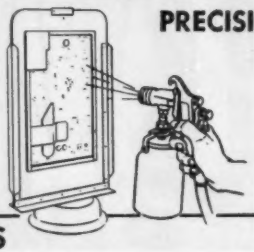

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STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

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creasing the depth of the container while, at the same time, giving consideration to container accessibility at the work place. This was accomplished by increasing the depth to 48 inches and hinging one side so that it could be dropped. As a result, container capacity was increased 60 percent at only a slight increase in cost.

Conditions Not Constant

Again, factors may enter which vary between plants, or even within one plant, which would alter conditions to the extent that this particular solution would not be economically practical. For one plant, the use of a collapsible wire container might prove economical, while for another, the use of racks and pallets might be the answer. The solution to both problems might depend primarily on product design. Here again the decisions made should be founded on application of the sound principles which control the course of action toward an economical and effective system.

Follow-Up. A final principle was applied to the follow-up of the new system:

10. *The education of all personnel concerned with the new container or handling system is imperative.*

This principle of job follow-up is by far more important than the planning function which must precede it, since a plan is not carried out by the planners but by those people on the operational level. The success of the plan is measured by how well it is received by these people, and how stimulated they are to using it.

For instance, when the special wire containers to handle furnace domes were first put into use, everyone directly and indirectly concerned with the proposed plan had to be notified. The plan was quite simple—only three different parts were to be handled in the containers. This instruction had to be given to a large group of employees because, present in the same area, were smaller and heav-

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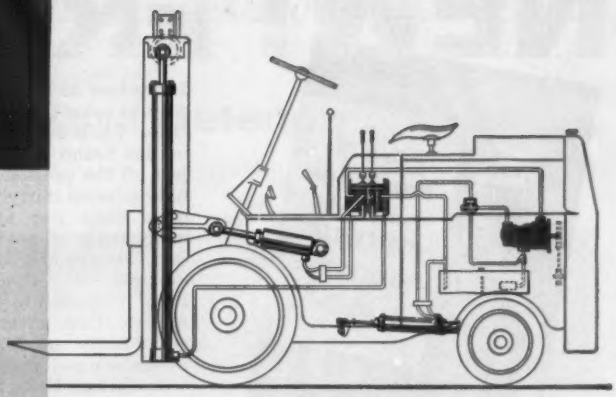
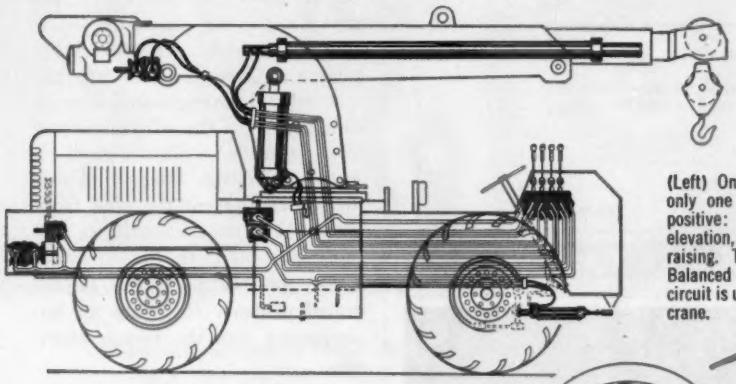
Designate Superior Materials Handling Equipment

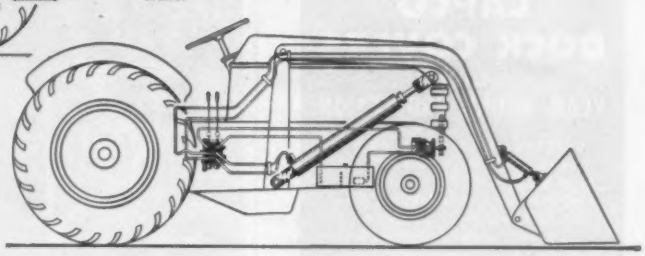
"Nobody sets a diamond in a brass ring." And when a manufacturer of materials handling equipment uses Vickers Hydraulics, it is indicative of superior quality throughout. To the inherent advantages of hydraulic control, Vickers adds the benefits of a nation-wide and full time field engineering and service organization of unequaled experience. Vickers has the complete line of hydraulic equipment necessary to take undivided system responsibility . . . to eliminate any risk of incompatibility of hydraulic components. For further information, ask for new Bulletin M5101A.



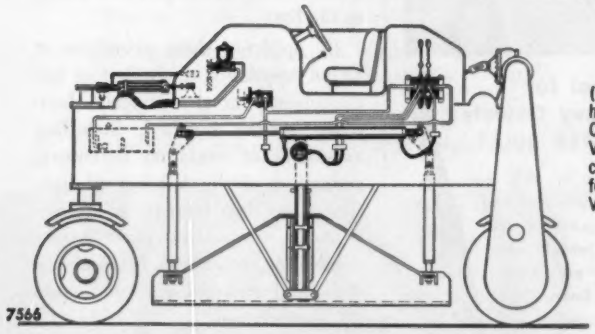
(Above) Fast tilting and lifting are possible along with exclusive "feathering" ability. Also, fingertip power steering permits operator to maneuver vehicle with one hand and control loading operations with the other. Additional vehicle attachments can be hydraulically controlled by simply adding sections to existing control valve eliminating necessity of mounting separate valves.



(Left) One Vickers Hydraulic System (using only one pump) provides fast, smooth and positive: (1) turntable rotation, (2) boom elevation, (3) boom extension, and (4) load raising. Turntable is driven by a Vickers Balanced Vane Type Fluid Motor. Another circuit is used for power steering this hydraulic crane.



(Right) Fast, easy and dependable operation of front end loader depends upon Vickers Balanced Vane Pump and Vickers Two-Section Directional Control Valve. Automatic wear compensation is inherent in all Vickers Balanced Vane Type Pumps. Note simplicity of installation.



7566

(Left) Straddle carrier uses hydraulic power to handle the load with precision and speed. Compact, two-section Vickers Multiple Unit Valve has double-acting valve for opening and closing load hooks and single-acting section for raising load. Separate circuit provides Vickers Hydraulic Power Steering.

WRITE FOR BULLETIN M5101A

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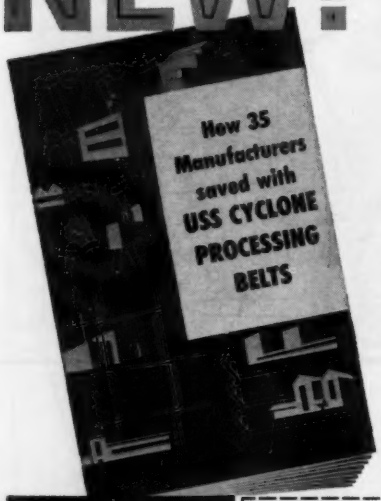

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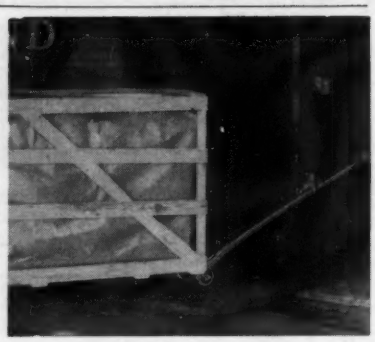

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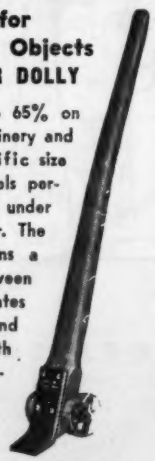

MICRON, INC., Dept. F., Bettendorf, Ia.

Circle No. 112 on Reader Service Card

ier parts which, if used in the same containers, would result in container overloading.

Supervision also played an important part in this program through direct instruction to the employee. However, it was also the responsibility of the engineer-in-charge to aid in this instructional phase and to make sure everyone was contacted and satisfied.

Educating personnel in the operation of the system is not the engineer's sole reason for participating in this instruction period. During this phase, the shortcomings which are invariably present in any new plan are uncovered and the engineer-in-charge can then make the adjustments or changes needed to insure more effective operation. Neglect of this phase can prevent the plan from functioning as efficiently as initially proposed. In the final analysis, the new plan must be operated properly to insure an improvement over the former methods.

The 10 principles discussed represent a few of a much larger group which can be applied to material handling as well as to problems in other fields of engineering. New principles are constantly being developed and added to the list.

By applying these principles at Delco Appliance, a number of improvements in the material handling system resulted, including reduction of container inventory, reduction of the number of handlings per day, increase in storage capacity, improved plant safety conditions, reduction in receiving time and reduced shipping costs on some items.

These examples demonstrate the concept of thinking in terms of basic principles and applying them to the gathered data which is recognized as the essential part of the formula for an economical and effective solution to engineering problems.

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2. Automatic switching to preset Conelrad frequency in event of an alert.

3. In absence of radio signal, automatic switching between broadcast station and Conelrad "cluster" stations until signal from one or other is received.

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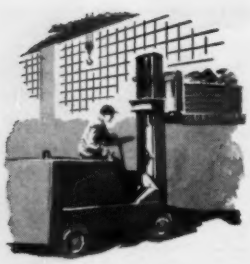
Being interviewed is H. A. Fuggiti, Acting Senior Development Engineer

"Here's where the heavy slugs of power come from"

At the Exide Laboratories — **Reporter:** Just exactly what part of the battery is that, Mr. Fuggiti?



Fuggiti: This is the Exide-Ironclad positive plate. And in any battery, power reserve is governed by positive plate area.

Reporter: Then do you mean that Exide-Ironclad Batteries have *more* positive plate area?

Fuggiti: Exactly. You can see that here. The cylindrical power tubes are arranged in a row. So the semicircular sides give an effective plate area one-third more than the plate size.

Reporter: How does that increase power reserve?

Fuggiti: Because there's a bigger working surface of battery plate exposed to the electrolyte. Power response is faster.

Reporter: What does this mean in battery performance?

Fuggiti: It means the battery can provide power to spare for peak power loads as well as a dependable source for continuous loads.

Reporter: Obviously this is an important feature of the Exide-Ironclad Batteries.

Fuggiti: Yes it is, but it's just one of many engineering details that contribute to their long life and high capacity.

Note to battery users: Whenever you order heavy duty batteries or the equipment that requires them, be sure to specify Exide-Ironclad. For detailed bulletin, write Exide Industrial Division, The Electric Storage Battery Co., Philadelphia 2, Pa.

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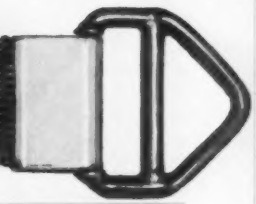
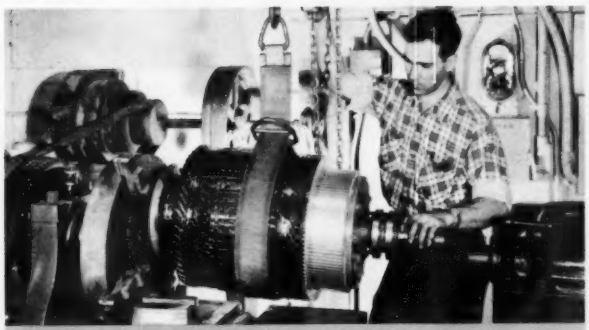
that once you've tried a GRIPPER Woven Wire SLING

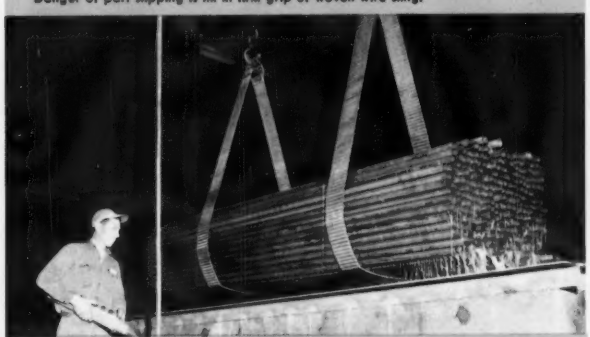
YOU'LL AGREE IT BEATS ANY SLING ON THE MARKET FOR HANDLING EASE, SPEED, SAFETY!



We're not kidding! **If you're not already using Gripper slings, just buy one to use in your most common lifting operations and try it for one month. If, after that time, you feel that some other type of sling is easier, faster and safer to use, just tell us and we'll see that you get one gallon of freshly shucked, succulent salt water oysters from the famous Chesapeake Bay country. Of course, if you do agree with us (and we're sure you will) you won't owe us a gallon of oysters. Just keep using and buying Gripper Slings. We're up to our ears in oysters already. Fair enough? Then order your Gripper Sling today. Standard sizes are available for loads up to 100,000 pounds. Special sizes on request. Our oyster-offer expires March 31, 1957 because oysters aren't very good after that.**



One man using a Gripper Sling in *choke hitch* easily performs job formerly requiring three men. Positions heavy electric motor armature in lathe without damaging coils. Danger of part slipping is nil in firm grip of woven wire sling.



Used in *basket hitches* two Gripper Slings move steel tubing through acid pickling process. Broad sling body won't crush tube walls. Corrosion resistant alloy of sling is not attacked by pickle solution.

WHAT ARE GRIPPER SLINGS? An entirely new concept in slings, combining the strength of steel with maximum flexibility and adding the exceptional load stability of a wide bearing surface. Gripper Slings are safer than wire rope, flexible as manila, gentle as canvas, more versatile than any . . . yet average only $50 apiece. You get all these advantages, plus extremely long life, because Gripper Slings are all metal; there's nothing to rot. They're made of woven wire . . . thousands of sturdy wire strands in a smooth transverse-loop construction that absolutely can't snap or tear suddenly.

Gripper Slings are safer and easier to handle, faster to rig. Woven wire construction prevents whipping, kinking, tangling. There are never any sharp, loose strands to snag load or operator. They maneuver easier, store more compactly.

Gripper Slings are made for *your* job. For maximum capacity, the strength is there. For maximum grip on small or irregularly shaped loads, the flexibility is there. If you're worried about damaging soft loads or machined surfaces, forget it! The smooth surface of Gripper Slings minimizes cutting or scratching . . . or for extremely delicate handling, you can have PVC or Neoprene coverings.

Gripper Slings, *pretested and guaranteed* to meet loading specifications, are available in standard lengths and widths with capacities up to 100,000 lbs. Special sizes and corrosion resistant alloys available on request.

GRIPPER* Woven Wire *SLINGS are sold through . . . materials handling and safety equipment distributors, mill supply houses. Call your nearest distributor for full data or write direct for free catalog, price list and name of nearest distributor.

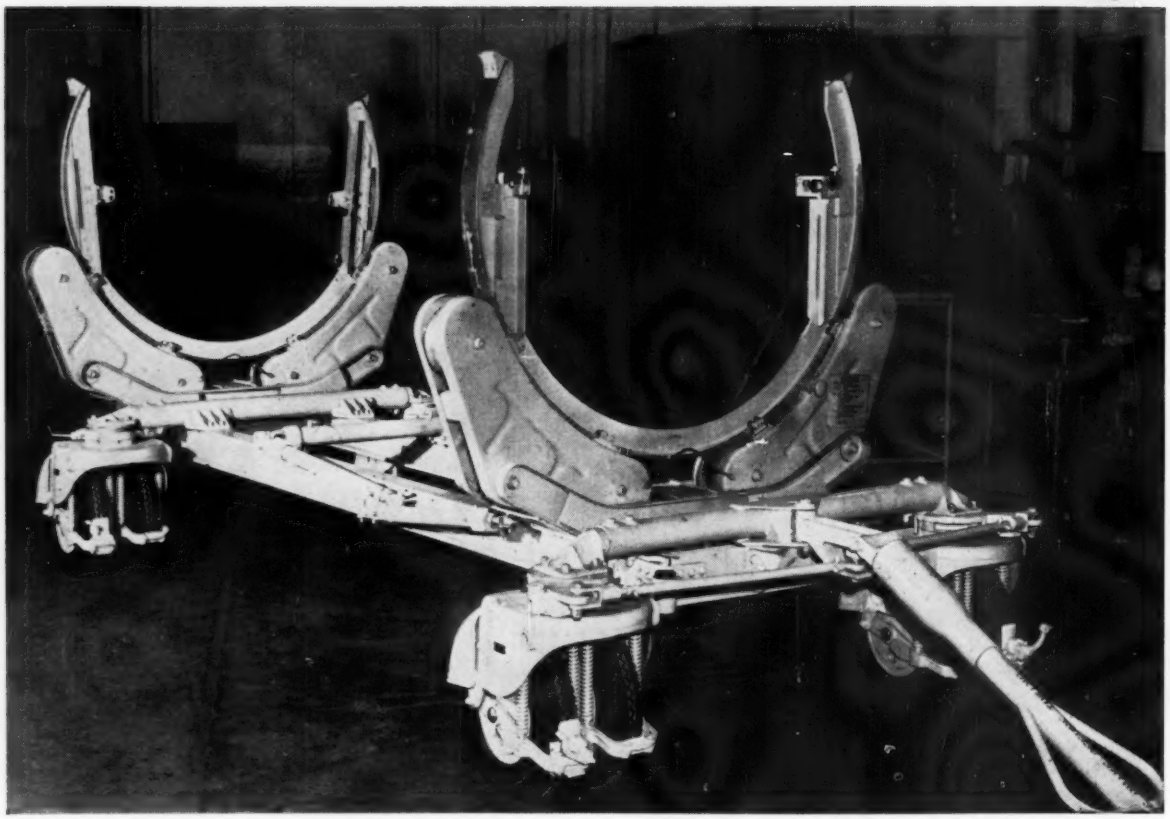
The Cambridge Wire Cloth Co.

WIRE CLOTH | WOVEN WIRE CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Cambridge, Maryland

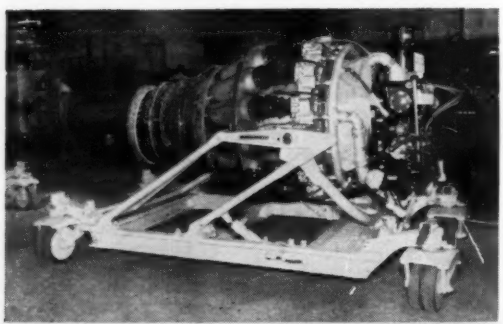
DISTRIBUTORS— a few territories are still available. Get in touch with us today for details on this sensational materials handling tool, available *only* from The Cambridge Wire Cloth Company.

DOW



THE COST OF HANDLING these special aircraft dollies is cut sharply by using lightweight, strong magnesium.

Magnesium handles the big jobs, too!



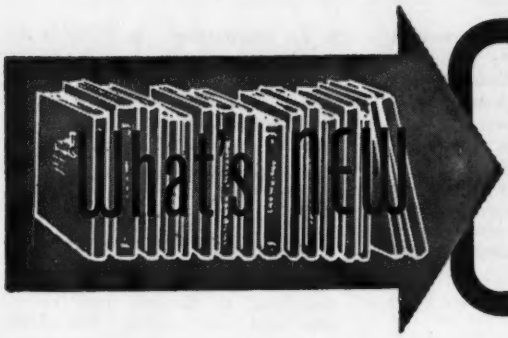
MAGNESIUM EXTRUSIONS permit substantial weight reductions on huge dollies used for inter-plant handling of aircraft engines and body parts.

Specially designed equipment is needed to handle bulky, heavy aircraft engines and body components. This equipment must be strong and rigid enough to safely carry loads weighing tons, but light enough to be easily moved. That's why many structural members of these dollies are *extruded from magnesium*—the lightest of all structural metals.

If you're buying materials handling equipment, make sure you're getting all the advantages magnesium can give you. If you're building your own, Dow offers complete facilities for design, engineering and production of magnesium extrusions. For more information, call the nearest Dow sales office or write THE DOW CHEMICAL COMPANY, Dept. MA368S, Midland, Michigan.

YOU CAN DEPEND ON DOW

Circle No. 154 on Reader Service Card for more information



in useful literature

A bibliography of New and Current Manufacturers' Publications available upon request. Indicate choice (s) on self-mailing Reader Service Card on pages 33 and 34.

Hand Hoists Featured:

The Yale & Towne Manufacturing Company has announced the publication of a new catalog covering the key features and specifications of its lines of hand hoists, Pul-Lifts and plain geared hand hoist trolleys. The 44-page booklet describes in details Yale's Load King Hand Hoists in capacities of ½ to 12 tons, spur gear hoists from ¼ to 40 tons, and Pul-Lifts built in capacities from ¾ to 15 tons.

Circle 170 on Reader Service Card

New Belting Catalog Available:

An entirely new belting catalog and engineering handbook has been produced by Imperial Belting Company, and is offered to users of industrial belting. The literature gives complete descriptions of the Imperial brands of stitched canvas belting for conveyors, elevators and power transmission. It contains installation photographs and accompanying service records in many industries. Among features of special interest are a conveyor and elevator belting brand recommendation chart, a guide to maximum belt life plus pages of technical data dealing with such subjects as belt tension, safe working loads, pulley diameter and belting maintenance.

Circle 171 on Reader Service Card

Describes Revolutionary Truck:

Valley Craft Products, Inc. offers literature describing its new line of two-wheel hand trucks, equipped with safety hand-operated brakes. Designed primarily for handling loads up to 1000 pounds consisting of bags of granular and powdered materials, the new truck is equipped with a special shoe which automatically locks it into tilting position as the truck is moved vertically against the load, allowing the tipping action to be accomplished with a minimum of effort. The design permits the truck to roll up and down stairs with ease, even when fully loaded. Other models are available for handling boxes and cartons, appliances, drums, etc.

Circle 172 on Reader Service Card

Describes New Strapping Machine:

Steel strapping and packaging operations can now keep pace with the fastest production lines with the Acme Steel F3 Strapping Machine, described in a new folder just published by Acme Steel Products Division, Acme Steel Company. The new 4-page bulletin shows typical applications as well as specifications of the pneumatically powered and electrically controlled machine, designed for applications where compressible or solid units must be strapped quickly and economically. The machine can be fit into existing conveyor lines, and can compress, tension, seal and cut as many as three straps simultaneously.

Circle 173 on Reader Service Card

New Power Sweeper:

A new power sweeper with a hopper capacity of more than 4 cubic yards is described in a 16-page catalog published by Wayne Manufacturing Company. The 3-color leaflet contains complete technical information about Wayne's Model 550 sweeper. Described are such features as power steering, power brakes, 275-gallon water capacity and a hopper capacity one-third greater then the smaller Model 450.

Circle 174 on Reader Service Card

Multiplies Man Power:

The Louden Machinery Company has prepared a 52-page booklet describing its line of monorail and crane equipment. The publication presents in narrative form the advantages of Louden's overhead material handling systems, as well as sections on mechanized handling in general. Several applications of cranes and monorails are discussed.

Circle 175 on Reader Service Card

Roller Chain Catalog:

An 80-page catalog recently published by Acme Chain Corporation is devoted to standard and special roller chains manufactured by the firm. Both riveted and detachable types are covered, in a variety of sized, styles and capacities for almost any conceivable application. Specifications and prices are included, as well as typical installations. Special sections are devoted to chain selection, lubrication and other general information.

Circle 176 on Reader Service Card

Push Button Dock Leveler:

Hartman Metal Fabricators, Inc. has issued a 2-page bulletin describing its Model 5000 Power-Dock leveler with push-button control. A metal ramp bridges the gap between vehicle and dock, and is adjustable for various heights at the push of a button. The unit is neither hydraulic nor counterweighted, but operates through the electromechanical action of electric motor, sprocket and chain. It locks automatically should the vehicle accidentally pull away from the dock. Since it is supplied as a complete package, no assembly is required, and installation is simple. The unit holds 15,000 pounds without support of the truck. Rollover capacity is 20,000 pounds.

Circle 177 on Reader Service Card

Drag Line Cart Data:

Nutting Truck and Caster Company has made available a 4-page folder describing its new improved drag line conveyor cart. Bulletin 56-MF lists specifications for the Cargo Carts, which are available with five different tyes of drag line hitches, for overhead or under floor drag lines. The carts have replaceable hardwood platforms, kiln dried to prevent warping. They also have rigid non-bend frames, and heavy duty swivel casters which attach with bolts and nuts to provide easy maintenance and replacement.

Circle 178 on Reader Service Card

Tape Data Available:

Tuck tapes are the subject of literature which is available from Technical Tape Corporation. The literature describes the company's pressure sensitive paper tapes, cloth tapes, cellophane tapes, electrical tapes, and reinforced tapes. Several different specific tapes, designed for a variety of individual applications, are listed in each of these categories.

Circle 179 on Reader Service Card

Describes Entire New Line:

A new 16-page catalog, illustrated in vivid colors, is offered by the Industrial Truck Division of Clark Equipment Company. The booklet describes the new Clarklift line of fork trucks, and presents new features of the trucks. Exploded views and schematic diagrams are included, for all components of the Clarklift line.

Circle 180 on Reader Service Card

Semi-Automatic PalletLoader:

A 4-page bulletin recently published by Mathews Conveyor Co. illustrates and describes the operations of the firm's new semi-automatic pallet loader. Designed for stacking cartons or flattened bags on pallets in any pattern, the new unit simplifies palletizing operations in a wide variety of installations. Stacks of empty pallets are loaded into the dispenser by fork truck. Containers are received from a conveyor line, arranged into layers by an operator, and placed on the pallet in predetetrmined number of layers. Fully automatic pallet loaders are also described.

Circle 181 on Reader Service Card

Added Strength in Coated Fabric:

Coated nylon Fiberthin, bringing together a revolutionary type of fabric and a special vinyl coating, is described in a bulletin issued recently by United States Rubber Company. According to the manufacturer, Fiberthin provides the greatest strength per square inch of weight that has ever been developed in a coated fabric. The fabric has high resistance to sunlight, oils, gasoline, most acids, alkali and salt water. It is waterproof, flame resistant, dimensionally stable and will not crack at -67°F.

Circle 182 on Reader Service Card

Introduces 5-Ton Gas-Electric Truck:

Complete drawings and specifications of the Automatic GLF-100, a gas-powered electric-driven fork truck with a 10,000 pound capacity, are presented in a 4-page brochure by Automatic Transportation Company. Combining the advantages of gas and electric power, this 5-ton Dynamotive's power plant consists of a gasoline engine powering a generator which, in turn, powers an electric drive motor. This eliminates the necessity for battery charging, yet retains the economy and simplicity of electric power. No transmission or gear shifting is required.

Circle 183 on Reader Service Card

New Bulletin on Static Switching Systems:

A new publication offered by General Electric Company describes the operation of a static switching system, and lists its advantages. Bulletin GEA-6364 discusses areas for applying static switching systems, and lists such advantages as reduced downtime, easy maintenance, greater reliabilty, greater flexibilty, reduced inspection and replacement, and minimized atmospheric problems. The 8-page bulletin recommends this contactless control where a high degree of automation, frequent operation, of maintenance under severe atmospheric conditions are important factors.

Circle 184 on Reader Service Card

Makes Storage Yard into Warehouse:

A versatile crane solves storage, warehousing and handling problems in a case-history described in a 4-page folder offered by the Austin-Western Works division of Baldwin-Lima-Hamilton Corp. The Austin-Western hydraulic crane converts a storage yard into a warehouse for a tableware manufacturer. The literature explains the advantages offered by the crane in this type of operation.

(Also reviewed in November)

Circle 185 on Reader Service Card

Hook Scale Shown in Use:

Martin-Decker Corporation's bulletin M-25 shows many photos of the SU-20 Sensater hook scale in use. According to the manufacturer, the SU-20 is the only hydraulic scale in the country accurate enough to be certified. The new 4-page bulletin shows it in weighing operations in several different industries.

Circle 186 on Reader Service Card

Illustrates Fork Truck Attachments:

A new 4-page folder illustrating and describing its Cascade load clamp, side shift and rotating attachments for its line of powered industrial trucks has just been released by the Elwell-Parker Electric Company. The literature covers such equipment as the standard load clamp, side shift load clamp, standard clamp with pallet forks, and rotating forks. Seven different load arms are illustrated, together with accompanying text. Nearly three pages of tables are included, containing detailed specifications of the attachments, and which types are prescribed for various models.

Circle 187 on Reader Service Card

For Moving Coils:

Mansaver Industries, Inc. has recently published a new 4-page bulletin describing Mansaver grabs engineered especially for handling metal coils. A variety of grabs are described, including models for single or double rim gripping, triple coil handling, and other coil grab developments such as coil turnover grabs and rotating crane hooks.

Circle 188 on Reader Service Card

Air-Controlled Power Shovel:

A new catalog describing the fully air-controlled, crawler mounted Lorain "50" is now available from the Thew Shovel Company, manufacturers of the Lorain line of power shovels and cranes. The literature describes and illustrates the many new features incorporated in the "50", a popular model in the 1-yard class, and which have been designed to lessen operator fatigue, give fast working cycles and provide trouble-free operation.

Circle 189 on Reader Service Card

Centrifugal Reel Bulletin:

A new bulletin 76-A has just been announced by Sprout, Waldron & Co., Inc., describing the company's all steel centrifugal reel. This quiet, vibration-free operation has a unique, severe bolting action which gives a satisfactory screening performance on difficult-to-handle materials. It is particularly adaptable to materials where regulation flat or sloping sieve-type sifters cannot give the required results.

Circle 190 on Reader Service Card

Condensed Data on Electric Hoists:

A new 4-page illustrated bulletin, No. H-44, describes the complete line of P&H electric hoists. Issued by the Harnischfeger Corporation, the bulletin includes condensed specifications and specially prepared cutaway photographs of the complete Hevi-Lift and Zip-Lift hoist line. Especially featured is the new P&H control cabinet, newly designed as a result of extensive surveys among hoist users.

(Also reviewed in December)

Circle 191 on Reader Service Card

Steel Shelving Manual Available:

Equipto Division of Aurora Equipment Company has released a new 48-page booklet, analyzing various types of steel shelving, drawers and lockers. The new 1957 Reference Manual No. 485 also describes work benches, tables and other shop equipment for storage, office, plant and warehouse.

Circle 192 on Reader Service Card

Strapping Applications Shown:

The Gerrard Steel Strapping Division of United States Steel Corporation has just released a new 36-page "Blue Book of Packaging", containing 130 photographs of different strapping operations, as well as a complete review of U.S.S. Gerrard products. This booklet includes items ranging from semi-automatic machines for reinforcement and unitizing of corrugated containers, to the strapping used for flat carloads of lumber and packaging of sheet steel.

(Also reviewed in December)

Circle 193 on Reader Service Card

Adds Tray Model to Expendable Pallet Line:

Titan Pallet Company has recently made available a 4-page folder announcing the development of a tray-type model to supplement the firm's line of expendable pallets. The new unit is claimed to have capacities up to 1 ton, and can stack loaded up to four high. Constructed of paperboard, the pallet is handled the same as conventional wooden pallets, and lends itself to bag, carton and bulk material handling. The tray lip serves to hold loads securely, to help cushion products, and to prevent possible shifting during transit.

(Also reviewed in December)

Circle 194 on Reader Service Card

Color Film Lists Truck Benefits:

The importance of visibility and safety factors in the design of lift trucks is shown in a new 16 mm color film, "The Hyster 'Monomast' Lift Truck". The motion picture outlines Hyster's development and the advantages of the new single member upright. On-the-job scenes filmed at various industries show the Hyster Space Saver 30 and 40 lift trucks of 3000 and 4000 pound capacities on cushion tires, and the Hyster 20 of 2000 pound capacity on pneumatics, all equipped with the new Monomast upright.

Circle 195 on Reader Service Card

Catalog on Flexible Couplings:

Tortionally flexible Morflex couplings are fully described in a 24-page catalog offered by Morse Chain Company. The Morflex principle, employing pre-loaded rubber biscuits as the flexible medium, is explained and illustrated. Complete dimensions and specifications are given for standard, double and radial type couplings, with additional data on coupling driveshafts. Tortional deflection charts, with instructions for use, explain the method of coupling selection and controlling the tortional vibration of a system.

Circle 196 on Reader Service Card

Case-By-Case Pallet Unloading:

An ingenious new automatic pallet unloader, developed by the Alvey Conveyor Manufacturing Company, is described in detail in a new engineering bulletin just issued by the firm. Called the Alvey De-Palletizer, the machine is designed to receive pallet loads of cases and automatically unload each pallet onto a conveyor line. The cases move away from the unloading line, in single file, at a rate of 25 to 30 cases a minute. The incoming and off-bearing conveyor lines can be custom designed to suit special plant requirements.

Circle 197 on Reader Service Card

Wirebound Catalog:

A new 8-page catalog on Generalift standard industrial wirebound pallet boxes has been announced by General Box Company. The catalog describes the many ways that pallet box bulk handling can be applied, and provides complete specifications.

(Also reviewed in December)

Circle 198 on Reader Service Card

New Caster Catalog:

A new condensed catalog has just been issued by the Nagel-Chase Mfg. Co., covering their complete line of light duty casters produced for manufacturers of appliances TV consoles, furniture, tool carts and light duty trucks. The literature illustrates and describes the standard sizes, styles and types of casters available. Nagel-Chase will design and produce special casters or brackets for special purposes where production warrants.

Circle 199 on Reader Service Card

Portable and Industrial Elevators:

Bulletin 5211 recently published by Barrett-Cravens Co. covers, in 65 pages, the Barrett line of portable elevators, other industrial elevators, and portable cranes. Many applications of the equipment are pictured, and specifications as well as descriptive data are included.

(Also reviewed in December)

Circle 200 on Reader Service Card

Heavy Duty Diesel Crane:

A new six-page gatefold brochure—"The Orton Diesel Wrecker and the Combination Wrecker, Pile Driver and Bridge Derrick"—has just been released by the Orton Crane & Shovel Company. The bulletin describes the advantages of applying modern handling and control devices to heavy cranes of 75 to 250 ton capacities. Also described is the multi-purpose crane, a combination machine with a straight boom which can be used for wrecker purposes, long enough for use as a bridge derrick and with pendent pile driver leads which fold automatically when the boom is lowered for travel. The machine travels under its own power.

Circle 201 on Reader Service Card

Multiple Weighing Systems:

Bulletin 561, a 12-page brochure featuring practically every possible arrangement of Emery Tank and Bin Weighing Systems, is announced by The A. H. Emery Company. The new bulletin describes and illustrates the recently developed weighing system "package" which includes a wide selection of instrumentation, and the Emery Cell. The new "rolling ball" construction of the Emery Cell is described in detail. Also shown is the proper method of applying Emery load cells to various types of tanks.

Circle 202 on Reader Service Card

Describes Full Gas Truck Line:

The Yale & Towne Manufacturing Company has published a new brochure covering in detail the various models of its "Integrated Design" line of gas and LP-Gas powered industrial lift trucks. The booklet lists key features and specifications on trucks from 2000 to 10,000 pounds, with cushion or pneumatic tires, and with Yale Torque Transmission, Fluid Coupling or straight dry disc clutch. Details are also given for special trucks in the Yale lines such as stevedoring models, cotton and textile trucks, dust protected trucks and those bearing Underwriters' Laboratories GS Approval.

Circle 203 on Reader Service Card

Sprockets Available From Stock:

Grip-Master Sprockets are the subject of a 16-page booklet issued by Acme Chain Corporation. The publication describes various roller chain sprockets, giving illustrations and specifications for various stock sprockets which may be ordered "off the shelf". Mounting and dismounting instructions are included, as well as prices for both sprockets and hubs. Other sections of the booklet are devoted to roller chains, roller chain flexible couplings, steel weld-on hubs, and typical applications of Acme equipment.

Circle 204 on Reader Service Card

Automatic Pallet Loader-Unloader:

Food Machinery and Chemical Corporation has released a new 8-page bulletin describing its automatic pallet loader-unloaders. These machines are capable of handling wood cases, barrels and returnable containers at rates up to 20 per minute, and feature gentle, fully automatic electro-machanical operation. Several bottling plant installations are described, showing various models of FMC units, varying in flow pattern to suit different plant needs.

Circle 205 on Reader Service Card

Describes Gear Motors:

Bulletin GEA-6133A, offered by General Electric Company, illustrates product features and includes selection data, dimensions, ratings and specifications of General Electric fractional horsepower gear motors.

(Also reviewed in December)

Circle 206 on Reader Service Card

Conveyor Stars in Public:

The Mighty-Midget counter-top conveyor is the subject of a 4-page folder issued by Metzger Conveyor Co. Designed for public appearances on top of or directly behind display cases, the Mighty-Midget is zinc or cadmium plated, and is of open construction for ease in cleaning. Nickel plated nipple caps cover all shaft ends for safety and sanitation. The units are available in straight five foot sections, with matching curves of 45° or 90°. Widths available are 10¾, 14¼ and 17¼ inches.

(Also reviewed in November)

Circle 207 on Reader Service Card

Truck-Mounted Cranes and Excavators:

The new Model 254 truck-mounted cranes and excavators are fully illustrated in the new brochure published by the Hanson Clutch and Machinery Company. Suitable for such applications as crane, clamshell, trench-hoe, shovel, pile-driver and magnet uses, the machine is illustrated in the catalog performing these jobs. Details of boom construction, upper machinery deck patented hoist and crown assemblies are shown.

Circle 208 on Reader Service Card

Dock Loading Hose and Fittings:

A 4-page illustrated data sheet on its line of dock loading hose for handling gasoline and oil has just been published by B. F. Goodrich Industrial Products Company. The publication reviews the complete line of dock loading hose and provides technical information on construction, specifications and recommended uses. Information for fittings is also provided on a separate data sheet, which describes the various types of couplings, including new forged aluminum nipples and flanges, and new lightweight steel nipples and flanges.

Circle 209 on Reader Service Card

Holds 50 Wire Coils:

A combined skid and storage rack capable of accommodating as many as 50 heavy gauge wire coils at one time is the subject of literature available from Republic Steel Corporation, Pressed Steel Division. Intended to reduce the amount of individual coil handling by boom and fork lift truck, the one-piece unit consists of a corrugated steel skid welded to a U-shaped, open-sided superstructure. Both skid and superstructure can be made to any specified dimensions. The unit can be equipped with knee braces or channel runners as required.

(Also reviewed in December)

Circle 210 on Reader Service Card

Introduces New Nail Driver:

Nail-A-Matic, the newest member of the Powasert line of automatically fed nail drivers, is introduced in a 4-page folder offered by United Shoe Machinery Corporation. The Nail-A-Matic will drive nails from 2-penny up to and including 16-penny, at speeds up to 50 per minute. Nails can be driven flush, countersunk or left extended at the operator's discretion. The feeder is air operated, and the unit is designed for simple operation and maintenance.

Circle 211 on Reader Service Card

Publishes Sheave Specification Guide:

A new 16-page bulletin published recently by Fort Worth Steel & Machinery Company lists 739 different stock sizes of Fort Worth QD (Quick-Detachable) sheaves. Catalog 83-A, entitled "Fort Worth Standardized QD Sheave Specification Guide", lists stock sheave sizes ranging from one 3.4 inches in diameter and weighing approximately two pounds, to a giant six-foot sheave weighing about 1½ tons.

Circle 212 on Reader Service Card

Can Packers and Boosters Described:

Standard-Knapp Division of Emhart Manufacturing Co. has recently introduced an 8-page folder which describes the company's can packers and boosters, for off the line—into the case operation on high speed production lines. The units are adjustable to various sizes of cans, and are available in several models to fit different needs. Specifications and illustrations are provided in the catalog.

Circle 213 on Reader Service Card

Gives Motor Selection Data:

A new 12-page booklet published by Reliance Electric and Engineering Company gives full information on how to select ac motors for specific applications. Included in Bulletin B-2103-1 are such comprehensive selection data as speed-frequency relationship, NEMA design classes, torque characteristics, NEMA current and torque values, frame selection tables, and dimension charts and mechanical modifications for all sizes from 182 to 6085. Two pages are devoted to a pictorial glossary of motor enclosure terminology.

Circle 214 on Reader Service Card

Hardwood Container is Collapsible:

A fully collapsible hardwood shipping container, whose sides are flexibly prejoined to permit speedy assembly, is described in literature available from Atlas Plywood Corporation. The container, which has been named Ply-Bound, is stored flat but opens up into a square tube for use. After the product is bolted to the base, the tube is merely slipped over the unit and the top set in place. Closure is completed by nails or staples through the top and bottom of the container. The four sides which are securely cleated at each end, are joined at the seams by wire bands.

Circle 215 on Reader Service Card

For Handling Metal Coils:

Mansaver grabs, engineered especially for handling metal coils, are the subject of a 4-page bulletin issued by Mansaver Industries, Inc. A variety of grabs are illustrated and described in the literature, including models for single and double rim gripping, triple coil handling, core entry, diametral gripping, coil turnover, and several other specialized applications.

(Also reviewed in November)

Circle 216 on Reader Service Card

Storage Unlimited:

A new adjustable storage rack that has no clips, no bolts, and is assembled with only one hammer, is the subject of a 4-page bulletin available from Rack Engineering Company. The standard unit has a capacity of ten tons, and consists of uprights, "Z" bracing and shelf arms. The racks will accommodate pallets, skids, dies and bulk items, and are available in capacities of 15, 20 or 25 tons when required.

(Also reviewed in November)

Circle 217 on Reader Service Card

Film Shows In-the-Floor Conveying System:

Truckveyors, in-the-floor type conveying systems for moving 4-wheel platform trucks, are the subject of a new 16 mm sound and color film now released by Link-Belt Company. Entitled "Pathways to Profit", the film illustrates how Trukveyor installations solve problems in railroad terminals, motor freight docks, air and water terminals, distribution centers, parts depots, warehouses and assembly plants. Engagement and disengagement of 4-wheel trucks with the conveyor chain below the floor is clearly shown, as are operations of other components comprising the system.

(Also reviewed in December)

Circle 218 on Reader Service Card

Describes Two Electric Truck Models:

A new 4-page folder, illustrating and describing its new "Air Rights" 6000 pound capacity electric-powered fork truck, has just been published by the Elwell-Parker Electric Company. Two standard models are available: a 68 inch model which is designed for freight car and truck loading; and an 83 inch model designed for tiering where headroom is unrestricted. The free literature contains more than a dozen illustrations. Detailed specifications are likewise included.

(Also reviewed in December)

Circle 219 on Reader Service Card

Manual of Pressure Sensitive Tapes:

Various ways to use pressure sensitive tapes are disclosed in a new handbook just published by Mystic Adhesives Products, Inc. The new publication was designed as a handbook for designers, product engineers, purchasing agents and material handling men. Among its features is a 4-way "tape finder", which enables the prospective user to select tapes by government specification, manufacturer's product number, tape type and by special applications within 134 industrial classifications. The manual describes a line of several score of pressure-sensitive products including masking tapes, high temperature and non-staining waterproof cloth tapes, packaging and material handling tapes, colored printable tapes, electrical and specialty tapes, Mystic protective specialties, and a complete line of industrial adhesives. Price of the manual is $2.00. It may be obtained by writing directly to Mystic Adhesive Products, Inc., 2635 North Kildare Avenue, Chicago 39, Illinois.

35-Ton Crane Catalog Available:

The Thew Shovel Company has just published a 16-page catalog describing its new 35-ton Lorain Moto-Crane, recently added to the Lorain line of power shovels and cranes. The illustrated publication describes fully the major features of the entirely new design of the high capacity, heavy-duty lifting crane that can be transported over the highways.

(Also reviewed in December)

Circle 220 on Reader Service Card

Shows Latest Truck Design Trends:

Latest trends in lift truck designs are shown in a 12-page booklet offered by Hyster Company. Included are 25 different Hyster trucks and cranes ranging in capacity from 1000 to 30,000 pounds, as well as several popular lift truck attachments.

(Also reviewed in November)

Circle 221 on Reader Service Card

Industry Scales Described:

A variety of scales for industrial uses are described in Catalog No. 556 offered by Detecto Scales Inc. This 24-page booklet contains full descriptions, specifications and photographs of scales designed for all types of industrial weighing applications.

(Also reviewed in December)

Circle 222 on Reader Service Card

Explains Manufacturing Processes:

"Hard Work Wanted" is the name of a new 8-page brochure recently published by Caterpillar Tractor Company, to explain the manufacturing processes of its piston and cylinder liners. The publication is illustrated with many of the machine and inspection operations performed on these vital engine parts during their manufacture. Included are explanations of the exacting design standards met by Cat pistons, pins, rings and liners.

Circle 223 on Reader Service Card

Corrosion Resistant Re-Rated Motors:

A bulletin featuring the new series 254-U All-Weather re-rated motors developed by Robbins & Myers, Inc., is available from the company's motor division. The 8-page literature describes the new motor's features, highlighted by a specially treated corrosion resistant housing, which affords protection against all adverse weather conditions. Internal metal and cast iron parts are also given the anti-corrosion treatment. External design is such as to protect internal parts against entry of debris and other foreign objects.

Circle 224 on Reader Service Card

Handling Hardware with Conveyor:

A detailed field report, No. 99, has been released by The Rapids-Standard Company, Inc., telling how a Philadelphia hardware store has speeded up its customer service 30% by installing an inter-floor conveyor system. The report outlines the hardware store's problem of making faster order selection and delivery from the four floors and basement of its warehouse.

(*Also reviewed in December*)

Circle 225 on Reader Service Card

Conveyor Chain for Cases, Cartons:

Chain Belt Company has recently published a 4-page bulletin describing its new 9250 case conveyor chain. Designed specifically for handling cases, cartons, crates and cans, Rex 9250 chain will flex in two directions—laterally to a radius as little as 12 inches. The chain has a broad, flat carrying surface with bridged top link construction. It is furnished in corrosion and abrasion-resistant metal and will fit standard 2-inch cracks.

(*Also reviewed in December*)

Circle 226 on Reader Service Card

New Low-Lift Platform Truck:

A 4-page bulletin giving drawings and specifications of the new Model LO-2 low-lift platform electric-driven industrial truck, has recently been released by Automatic Transportation Company. Among the features of this 4000 pound capacity truck are balanced and shockless steering, automatically controlled and timed sequence of movement through all four horizontal speeds, fully equalized trail axle compensating for uneven floor conditions, and silicone treated motors capable of withstanding severe overloads, even after exposure to temperatures of 300° to 400°F.

(*Also reviewed in December*)

Circle 227 on Reader Service Card

New Container Material:

A 4-page folder illustrating seven basic types of Tri-Wall Bulk Packs for lightweight but heavy-duty packaging is being offered by Tri-Wall Containers, Inc. Tri-Wall Bulk Packs are made of Tri-Wall Pak, a new patented development in packaging which is said by the manufacturer to combine economy, strength and light weight. It is made of triple rows of fluting, similar to corrugated, and is said to be so sturdy that it can replace lumber, plywood and cleated fibreboard in the construction of many types of containers. Tri-Wall Bulk Packs can be made large enough to accomodate truck cabs, and in strengths great enough to carry extremely heavy loads.

Circle 228 on Reader Service Card

New Approach to Package Identification:

A new type of labeling product, and the new labeling process it has made possible, are described in a bulletin published by Dennison Manufacturing Company. The new product is called Therimage, and the process is Therimagraphy. Therimage is a special label paper, on which a heat-transferrable label is printed in any size, shape, color or design, including photographs. By means of a special device, this label design is transferred from the paper to the packaging material, giving quality comparable to a printed label. Labels may be placed inside or outside a wide variety of packaging materials, and application is said to be faster than conventional labeling processes. Operation of the equipment is completely automatic, and it can be used with standard wrapping, bundling or bag-making machines.

Circle 229 on Reader Service Card

Tips on Caster Selection:

Bond Foundry and Machine Company has just released its new 68-page Catalog No. K-40, offering complete specifications, illustrations and descriptive data on all types of Bond casters. An introductory section gives tips on simplified selection of the right casters for the job. In addition, the catalog offers a section describing other Bond material handling products such as hand trucks, drain racks, lift jacks, platforms and dollies.

(*Also reviewed in December*)

Circle 230 on Reader Service Card

Lists V-Belt Features:

Construction features of the Texrope grommet V-belt, said to provide 20 to 50 percent longer life than ordinary belts, are described in a new bulletin released by Allis-Chalmers Manufacturing Company. According to the bulletin, No. 20B6497C, the Texrope grommet V-belt has one-tenth the shrinkage, one-third the stretch, runs cooler and grips better than ordinary belts.

(*Also reviewed in December*)

Circle 231 on Reader Service Card

LP-Gas in Truck Fleets:

A new 8-page brochure entitled "How Truckers Save on Fuel, Lubrication and Maintenance" has just been released by Century Gas Equipment Company. The bulletin explains the five advantages of LP-Gas in truck fleet operations and points out the savings many operators realize through use of butane-propane as motor fuel. Well illustrated, it shows various types of carburetors, and compares Century's progressive jet carburetor with its metering valve to the conventional type venturi carburetor. Installation and schematic drawings are also included.

Circle 232 on Reader Service Card

Storage In Motion:

A new bulletin covering the concept of "Storage in Motion" for parts that roll, such as gears, screw machine parts, etc, is now available from the Gear-O-Mation Division, Michigan Tool Company. The 4-page bulletin No. GO-561 describes the equipment—storage units, collectors, distributors—developed by Michigan Tool's newest division. These units make up a complete demand feeding system for in-line machine operations, and offer a positive control of parts flow between successive operations.

Circle 233 on Reader Service Card

Releases Power Lubrication Data:

Up-to-the-minute details on the most recent developments in power lubrication systems are featured in a new catalog published by Lincoln Engineering Company. Complete information is given on new power-operated, centralized lubrication systems, including descriptions and functions of manual as well as mechanical and electric automatic controls. Photographs of various installations are included, as well as diagrams and information on ordering.

(*Also reviewed in December*)

Circle 234 for more information

Announces New Product Bulletin:

A new 4-page bulletin, describing the crawler-mounted Model C-35 Bantam, has been introduced by the Schield Bantam Company. The new bulletin, No. C-101, contains complete information concerning the latest specifications, features, capacities and application data for the company's crawler-mounted ⅜ cubic yard, 5-ton crane-excavator model. Complete machine specifications are listed, and operating ratings and capacity ratings are shown in conjunction with large, easy to read charts covering the crane, shovel and back hoe attachments.

(*Also reviewed in December*)

Circle 235 for more information

Hydro-Pneumatic Accumulator:

A 4-page bulletin published by Greer Hydraulics Inc. explains the operations of a hydraulic component which is said to cushion shock in the hydraulic system or fork trucks, when the trucks are subjected to abusive operation conditions. The accumulator consists of a flexible rubber bag charged with an inert gas, surrounded by hydraulic fluid and encased in a steel shell. When mounted to the hydraulic system of the truck, the unit absorbs severe shocks which might otherwise be transmitted through the system.

(*Also reviewed in December*)

Circle 236 for more information

Live Storage Racks:

A 6-page illustrated brochure offered by The Alvey-Ferguson Company fully describes the A-F line of Live Storage Racks. The literature tells how custom and pre-engineered racks can store, for short periods, such items as short-lived inventory, parts in process, palletized loads, different sized packages, component parts, etc. The literature contains a complete discussion of the live storage principle, engineering details, components available, and illustrations of typical installations.

(*Also reviewed in November*)

Circle 237 for more information

Pulpwood Logging Film Available:

"Pulpwood Logging" is the title of a new 16 mm sound and color film available for showing from Hyster Company. The motion picture describes hardwood logging methods in rugged territory near Bridgton, Maine. Complete operations—bunching, roading, cutting bolts and hauling—are described. The film shows how an operation involving 14 men produces two cords per day per man, from standing tree to mill. Production increase was said to be achieved through the use of Hyster-built and Caterpillar-built logging equipment.

(*Also reviewed in December*)

Circle 238 for more information

Packaging Machinery:

Automatic packaging equipment is described in a 4-page bulletin recently published by Pak-Rapid Inc. In addition to the basic Pak-Rapid, the literature contains information on the semi-automatic magazine feed for identical circular shapes, the semi-automatic conveyor feed for handling irregular long items, the automatic hopper feed for screws and metal parts, semi-automatic turret feed for irregular shapes, semi-automatic tray conveyor feed for assortments of small parts, and the automatic hopper feed for all types of tablets and capsules.

(*Also reviewed in December*)

Circle 239 for more information

New Booklet on Sweeping Congested Areas:

As a result of recent technical developments, many congested areas formerly swept by hand can now use power sweeping, according to a new booklet available from the G. H. Tennant Co. This 8-page booklet—entitled "Can We Use Mechanized Sweeping Profitably?"—discuss aisle widths, dust control, possible savings and other pertinent points. It also includes a check list, to determine a sweeper's usefulness, and its values for sanitation, safety, etc.

(*Also reviewed in December*)

Circle 240 for more information

Releases Bulletin on Magnet Line:

A new bulletin on the company's line of rectangular and rail handling magnets has been released by the Ohio Electric Mfg. Co. Bulletin 150-A describes the complete line of magnets ranging in size from 19 x 32 inches to 28 x 74 inches. Data is contained in the literature giving details on materials, construction, required headroom, dimensions and other important specifications.

(*Also reviewed in December*)

Circle 241 for more information

Catalog on Flexible Chain Couplings:

Morse Chain Company has announced that its 16-page flexible chain coupling catalog has been completely revised. Specifications, dimensions, ratings and applications are given on series DSC, series SA silent chain couplings and series DRC roller chain couplings. Pertinent information is also tabulated on stamped steel covers, plastic covers and split aluminum covers. Included in the catalog is general information explaining the purpose and function of flexible chain couplings.

(*Also reviewed in December*)

Circle 242 for more information

Describes Synchronous Induction Motor:

The Synduction motor, a synchronous induction motor which provides dependable constant speed, simplicity of operation and low first cost in a number of industrial applications requiring 40 hp or less, is described in a new bulletin by Allis Chalmers Manufacturing Company. Supplying high efficiency and relatively high power factor, the Synduction motor is capable of giving variable speed operation by variable frequencies up to and above 300 cycles, and speeds above 10,000 rpm.

(*Also reviewed in December*)

Circle 243 for more information

Thermal Impulse Heat Sealing:

An 8-page catalog offered by Vertrod Corp. offers illustrations, descriptive data and illustrations on the firm's line of thermal impulse heat sealing machinery. Hand, foot pedal and power-operated models are included in the literature, and models are included which are designed specially for drum liners.

(*Also reviewed in December*)

Circle 244 for more information

Closes Re-Usable Containers:

An entirely new type of metal closure device for plywood re-usable containers is described in a new brochure just issued by Metalstamp, Inc. The new closure employs a short stretch of metal strapping, to make possible a new type of knock-down, re-usable shipping container that is pilfer proof, dust and vermin proof, and adaptable to unit

loads. Containers are made in any size, and consist of six plywood panels which, when knocked down, occupy only 1/6 the space of assembled containers. The closure device allows the container to be assembled in 22 man-minutes, and the only tools required are standard strapping tools.

(Also reviewed in December)

Circle 245 for more information

Photoelectric Controls Applications Covered:

A new 16-page catalog offered by Autotron, Inc. illustrates widely varied types of photoelectric control equipment, and illustrates their application to industrial uses. Equipment described includes photoelectric controls ranging from moderate to ultra-sensitivity, high speed and impulse-actuated units, photoelectric and electronic timing controls, and a variety of light sources affording many special features such as beam intensity adjustment, extra low voltage connections, dual filament lamp and safety relays.

(Also reviewed in December)

Circle 246 for more information

Describes Complete Strapping Line:

A 36-page catalog recently published by Gerrard Steel Strapping Division, United States Steel Corporation, describes the full line of USS Gerrard steel strapping and strapping equipment. The booklet covers the history of strapping, and describes applications used in a variety of industries. It then goes on to describe and illustrate various types of round and flat strapping, seals, dispensers, tensioners, pliers, containers, cutters and other strapping accessories.

(Also reviewed in December)

Circle 247 for more information

Heat Sealable Polyester:

A 6-page brochure describing the new Scotchpak brand heat sealable polyester film is now available from Minnesota Mining and Manufacturing Co. The new brochure, printed in color, emphasizes the heavy duty packaging and protective wrapping abilities of the heat-sealable film, which can be used with regular sealing equipment, to give a seal as strong as the film itself. Scotchpak is available in two forms—type A, sealable on one side, and type B, sealable on both sides.

(Also reviewed in December)

Circle 248 for more information

Covers New SAE Boss Fittings:

A new catalog has just been published by Anchor Coupling Company, Inc., illustrating and describing the company's complete new line of SAE boss fittings and ring adapters to satisfy the new SAE Straight Thread Boss Standards, as specified in the 1956 SAE Handbook. A complete line of these new adapters is now offered by the company, in a wide range of sizes and styles. Also shown are the new Anchor tube nuts, available in short nut, SAE long nut and 3-piece assembly styles.

(Also reviewed in December)

Circle 249 for more information

Describes Three New Models:

"New Traxcavators for New Profits" is the title of a booklet recently published by Caterpillar Tractor Co. The 8-page booklet explains how the firm's three new Traxcavators—Nos. 933, 955 and 977—are designed to offer improved features to users. Pictures illustrate the three models at work on various applications, and are accompanied by production figures on specific contractor's jobs. Numerous attachments are also described.

(Also reviewed in December)

Circle 250 for more information

Racks:

A new catalog describing its full line of Floormaster trucks and Loadmaster storage racks is now available from Lewis-Shepard Products, Inc. Designated catalog No. 29-1, it contains complete specifications on both the trucks and the storage racks, and is illustrated throughout with drawings and photos. In addition, the catalog points out many specific commercial and industrial applications for this material handling equipment.

(Also reviewed in December)

Circle 251 for more information

For Tank and Bin Weighing:

Emery tank and bin weighing systems are the subject of a new 12-page booklet recently published by The H. A. Emery Company. The literature contains cross-sections, schematic diagrams, and illustrations of various weighing systems manufactured by the company.

(Also reviewed in December)

Circle 252 for more information

Describes New Electric Power Sweeper:

A new electric power sweeper which can work a full 8-hour shift without recharging is described in a 2-page bulletin recently made available by Wayne Manufacturing Company. The model 605-E sweeper is said to be especially effective where quiet and fume-free operation is needed. The literature describes such features as the new sweeper's built-in battery charger, three speed forward and one speed reverse transmission, and large effective hopper capacity.

(Also reviewed in December)

Circle 253 for more information

Describes LPG Cylinders:

Catalog 1502-A issued by The Weatherhead Company describes LP-Gas cylinders, designed in accordance with ICC Specifications 4BA 240 in models of 100, 60 or 20 pounds. Also described are industrial truck cylinders, in capacities of 43½, 33½ and 20 pounds. These propane containers are fitted with relief valve, liquid withdrawal valve and float gauge, as specified by the customer. Additional fittings such as fast fill valve and fixed liquid level gauge can also be supplied.

(Also reviewed in December)

Circle 254 for more information

Provides Instantaneous Visual Communication:

A new 4-page bulletin issued by General Precision Laboratory Inc., describes the use of GPL closed circuit television equipment in the industrial, banking, educational and medical fields. The parabolically shaped camera may be used with monitors or conventional TV receivers, and a remote control device makes it possible to pan, tilt, focus and adjust settings from a remote location.

(Also reviewed in December)

Circle 255 for more information

New Tractor-Compressor Literature:

Four new case histories have been published by the Le Roi Division, Westinghouse Air Brake Co., on the Tractair, a combination tractor and air compressor. These case histories, as well as the four which were previously offered by the firm, describe the all-purpose Tractair as used on air application jobs, with or without any of more than a dozen attachments.

(Also reviewed in December)

Circle 256 for more information

Crane Catalog Available:

A 24-page catalog recently published by American Hoist & Derrick Company fully describes the company's truck cranes and cruiser cranes, in 30 ton capacities. The literature points out the various components of the cranes, explaining the operation of the units and describing them in full detail.

(Also reviewed in December)

Circle 257 for more information

WITH THIS NEW ROEBLING CATALOG EVERYTHING IS SIMPLIFIED!

Recommendations

Sling Selection

Sling Ordering

Dimensional Information

Rated Capacities

Coded Systems for Ordering

. . . Not to mention your own materials-handling problem

This 52-page book contains concise, easy-to-find and easy-to-use information on:

All-Purpose Slings · Roegal® Cable-Laid Slings · Flatweave Slings
Railroad Slings and Special Assemblies · Fittings
General Slings Facts

The text is supplemented by drawings and photographs. This wealth of reference is yours simply for the asking. By filling out the coupon and mailing it, you'll get your copy *faster*.

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Dept. F, Trenton 2, N. J.

I'd like a copy of your new Sling Catalog.

Name_____

Company_____

Address_____

City_____ Zone____

State_____

Circle No. 78 on Reader Service Card for more information

PACKAGING COSTS . . .

(*Continued from page* 115)

Method 4 is the least refined of all the methods listed here. In that method the costs are all collected in either one or more overhead expense pools for general allocation to all business. Where that is done, packaging costs may not even be separately identified . . . being classified as miscellaneous supplies and indirect labor.

To this point, we have discussed only methods of accounting for packaging costs. Now, let us consider the pricing aspects. Where the contractor is performing Government cost type or retroactive pricing type contracts, its accounting records are generally the basis for recovering these costs. However, much of Air Force procurement these days is on a firm price or prospective pricing basis. Here the contractor generally uses estimating procedures in arriving at its proposed price. These estimates are usually based on historical costs, forecasts, bids, buying guides, budgets or time studies. Sometimes, they are pure guesses.

Our survey of packaging cost procedures disclosed that in most cases, contractors follow different methods in pricing than they do in accounting. We found, you will recall, that in accounting the most popular method was a combination of direct and indirect charges. However, when it comes to pricing, perhaps for purposes of expediency, the most popular method is one which uses a percentage factor for packaging costs. The same percentage factor is usually applied on an overall basis to estimated cost. There were some variations in the percentage as between spare parts and spare components and as between military services. Here again, just as in accounting, the percentage applied will not reflect the actual packaging costs for individual units.

Evaluation Methods

What is the Air Force position in evaluating the various methods used by contractors in accounting for and pricing packaging costs? We recognize that no single system is ideal for universal application. Existing circumstances will influence the method used. These circumstances could be diversity of products manufactured, multiplicity of parts, complexity and cost of the packaging process and type of procurement contract.

The Air Force accepts any accounting or pricing method which produces equitable results. In evaluating a contractor's treatment of packaging costs there are certain factors which are usually considered. These factors are: (a) the reasonableness of direct charges; (b) the reasonableness of overhead allocation; (c) comparative analysis—pricing vs. experience, AF depot standards, Industry standards.

Where cost determination is based on historical costs, it is a relatively easy matter to verify the costs incurred. The system of direct charges is also studied to determine that inequities do not exist. For example, we ascertain that when Government contracts are

NEW WALKIE powered lift truck offered in many models

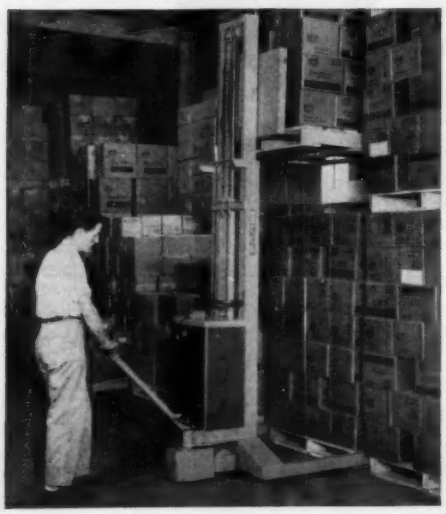
Walkie-Worklifter now features 1000 lb. and 1500 lb. capacities, with lifts up to 120".

Every plant, small or large, has drums or crates or pallets or skids that can be moved and stacked more efficiently with one of these Walkie-Worklifters.

Such varied industries as steel, rubber, glass, textiles, plastics, paper, meat and bread use the Walkie-Worklifter to reduce costs and to eliminate lost time in departmental materials handling. Letters from satisfied users report savings of 50% or more in specific materials handling operations.

All models are priced low and include batteries and built-in charging unit. Get the full story on Walkie-Worklifters. Write today on your letterhead, outlining your requirements. Or, for your future reference, ask for bulletin No. W555.

ECONOMY ENGINEERING COMPANY *(Established 1901)* **4524 W. Lake St., Chicago 24, Ill.**



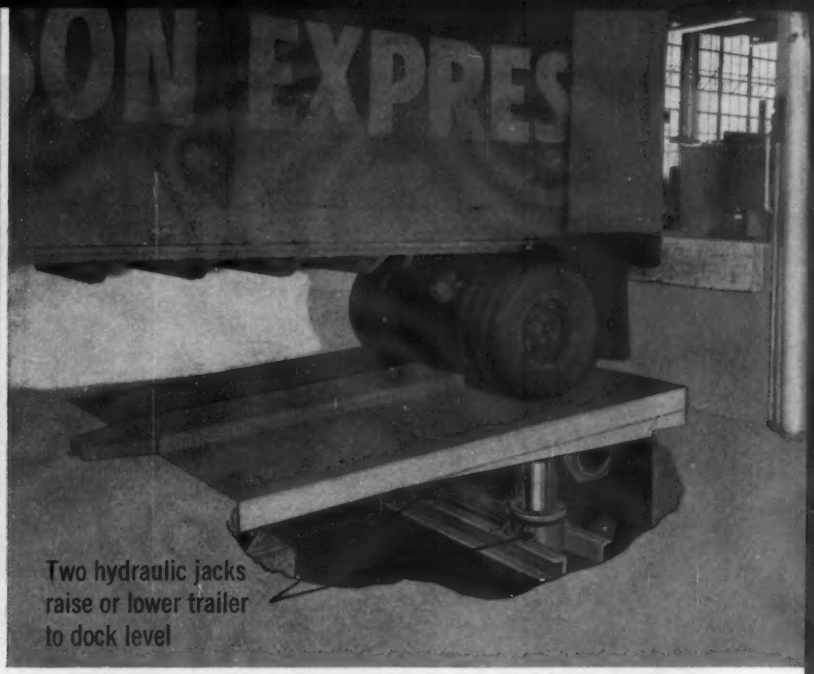
Straddle base Walkie stacking photographic equipment.

Extension cord control enables operator to ride up with the load.

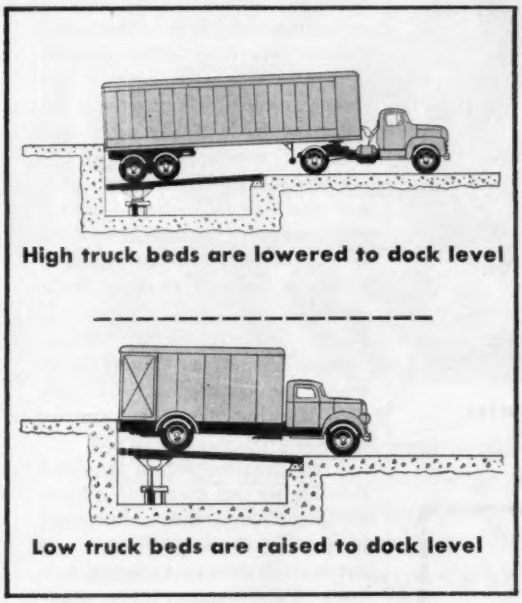
Effortless moving of 1000 lb. load →

Circle No. 161 on Reader Service Card for more information

NEW ROTARY Truck Leveler SAVES DOCK SPACE AND SPEEDS LOADING



Two hydraulic jacks raise or lower trailer to dock level



ECONOMICAL HYDRAULIC LIFT INCREASES EFFICIENCY
The new Rotary Truck Leveler, supported and moved by dual hydraulic jacks, raises or lowers the entire rear section of any highway carrier to bring the bed level with the loading dock platform. It has these important features:

Takes no space . . . installed in pavement in front of loading dock, leaving dock platform completely free of obstructions. Each Rotary Truck Leveler saves 96 sq. ft. or more of the building space required when a ramp is used.

Reduces to a minimum the incline angle between truck or trailer bed and dock. Materials handling equipment can move in and out with maximum speed and safety.

Handles any highway carrier at any loading dock. Has 40,000-lb. capacity and 28″ travel. Will never be made obsolete by changes in materials handling equipment.

Dependable, economical push-button operation by Rotary Oildraulic electric power unit, located wherever convenient. Practically maintenance-free.

Easily installed in shallow pit at new or existing buildings. Does not interfere with closing and locking of overhead doors.

Raised center curb section guides wheels onto runways for fast, accurate truck positioning.

The Rotary Truck Leveler is sold and installed by a nationwide organization. These specialists in hydraulic lifting devices can assist you on design and specifications for single or multiple unit installations. Dependability of the Rotary Truck Leveler is assured by Rotary Lift Company's experience in building over 100,000 oil-hydraulic lifts and elevators. Mail coupon for complete data.

Rotary also makes Hydraulic Ramps, Lifts and Elevators

Rotary® **TRUCK LEVELER**

Manufactured by ROTARY LIFT CO., Memphis 2, Tenn.

Specialists in oil-hydraulic lifting devices

Circle No. 144 on Reader Service Card for more information

MAIL FOR TRUCK LEVELER CATALOG

Rotary Lift Co.,
1071 Kentucky, Memphis 2, Tenn.

Please send new catalog on the Rotary Truck Leveler to:

Name _____

Address _____

_____

NEW BULLETIN TELLS ABOUT GRAVITY CONVEYORS TO

Speed Your Production

This new bulletin shows how to handle boxes, cartons, crates, bags, bales, etc. with simple inexpensive Farquhar Gravity Conveyors.

- ✻ Explains when to use wheel or roller type.
- ✻ Gives complete specifications including load capacities.
- ✻ Includes photographs of actual installations to help you plan.
- ✻ Shows curves, spurs, stands and other accessories needed for complete installation.

SEND THIS COUPON FOR **Free** BULLETIN
or write on Company Stationery

A. B. Farquhar Div., The Oliver Corp.
Conveyor Dept. J-06, York, Pa.
Factory Branch: 618 Elm St., Chicago 10, Ill.

Send me Farquhar Gravity Conveyor Bulletin 801

Name_____
Company_____
Address_____
City_____ State_____

OLIVER Farquhar CONVEYORS

Power Belt and Gravity Conveyors

Circle No. 30 on Reader Service Card for more information

charged directly for the costs of specified special packaging, these same contracts do not share in an allocation of commercial packaging expenses which have been classified as overhead. We also check to see that the overhead rates used compare fairly with the experienced rates for the applicable period. This same sort of a check is made where packaging expenses are collected in a separate pool and liquidating rates are used.

Where estimating procedures are used for pricing we run into some difficulty in our evaluation. This particular problem arises when the estimates cannot be compared with previously experienced packaging costs. It is further complicated where no other reliable information exists to support the reasonableness of the price. We have pointed out that, for purposes of expediency in pricing, percentage loadings were used, and that in accounting, packaging costs were treated in various ways, partly as direct charges, partly as indirect charges, some identified and some unidentified. Where this problem arises, the contracting officer usually requests the contractor to furnish data showing how the estimates were arrived at.

From the information presented thus far we can draw this general conclusion: In cost accounting and in pricing, packaging costs are rarely dealt with on an actual unit basis. Furthermore, where segregation of packaging costs are not made in contractors' records, this information is not even available in total by contract, by product line, or by contractor.

This is undoubtedly disappointing information for Air Force packaging people who have the responsibility for the maintenance of efficient and economical packaging systems and procedures. How can they fully carry out these responsibilities without reliable information as to unit package costs?

There are other courses that

How the Gar Wood 75BT helps

MATERIALS FLOW...SAVINGS GROW!

Profits may not begin in your yard, but chances are that profits are being lost there... drained off by increased materials-handling costs. The Gar Wood 75BT is an efficient way to cut these costs to a minimum. Here's why:

1. DOES MORE WORK!

- 20-ton capacity . . . plus the mobility to use it!
- Power-actuated drum clutch makes operator's job easy!
- Rugged design means steady production under even heaviest shocks and strains!

2. REQUIRES LESS MAINTENANCE!

- Large capacity drums and sheaves eliminate fouling . . . add to cable life!
- Flame-hardened gears and shafts, liberal use of anti-friction bearings, oil-bath lubrication . . . all add to unit life!
- Compact machinery deck makes servicing faster, less expensive!

3. FAR SAFER TO OPERATE!

- Worm-driven boom hoist makes raising or lowering completely safe!
- Direct manual controls eliminate confusing systems of lines and cylinders!
- Excellent operator-visibility at all times!

See for yourself! Contact your Gar Wood dealer, or write to:
Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

Circle No. 146 on Reader Service Card for more information

Circle No. 56 on Reader Service Card for more information

A modern truck for modern plants

The HydroLectric

with most modern features

- 2 Drive Wheels instead of one
- 2 Braking Systems available instead of one
- 4 Wheel Stability instead of three
- Alloy Gear Transmission instead of chains
- 100% more Steering Ease —Greater Maneuverability
- 50% less Maintenance —Easy Accessibility
- Finger-Tip Control —Greater Safety

Put these modern features to work for you, greater profit at no additional cost.

Platform Model K

Write for Bulletin KW

STUEBING Designed • Engineered • Built

LIFT TRUCKS, INC. / CINCINNATI 14, OHIO

THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

"Red Head" PULLEYS

Any Size—Any Shape

Don't say conveyor pulley—*SAY* Red Head Seamless Solid Steel Conveyor Pulleys—the Conveyor Pulleys with no seams on the surface—guaranteed longer belt life—for you with quick delivery. Available in diameters of 2" to 36", in faces of 6" to 168" and each "Red Head" represents years of meeting the most exacting demands of all types of Conveyors. Both Crown and Straight faces available. Write or call us for immediate attention.

MERCURY INDUSTRIES, INC.
(PULLEY & ROLL DIVISION—DEPT. PR-11)
HILLSDALE, NEW JERSEY
TEL. WESTWOOD 5-7636

Circle 155 on Reader Service Card

1/4" Scale LAYOUT SUPPLIES

GRID SHEETS—

MYLAR: .010"-thk; black-line; in continuous rolls.

ACETATE: (1) Black-line: reproducible through ozalid, blueprint or similar machines.
(2) Blue-line: non-reproducible grids, for presentation prints.

LAYOUT TAPES—

Various widths in 6 colors.
Pattern Tapes: Conveyors, aisles, architectural details, etc.

REPRO-TEMPLETS—

Black Film: For reproduction.
6 Colors: For presentation layouts.

For brochure and catalog write to:

REPRO-TEMPLETS INC.
Dept. F17 Oakmont (Alleg. Co.), Pa.

Circle 169 on Reader Service Card

PACKAGING COSTS

Continued

can be pursued in order to achieve the Air Force objective.

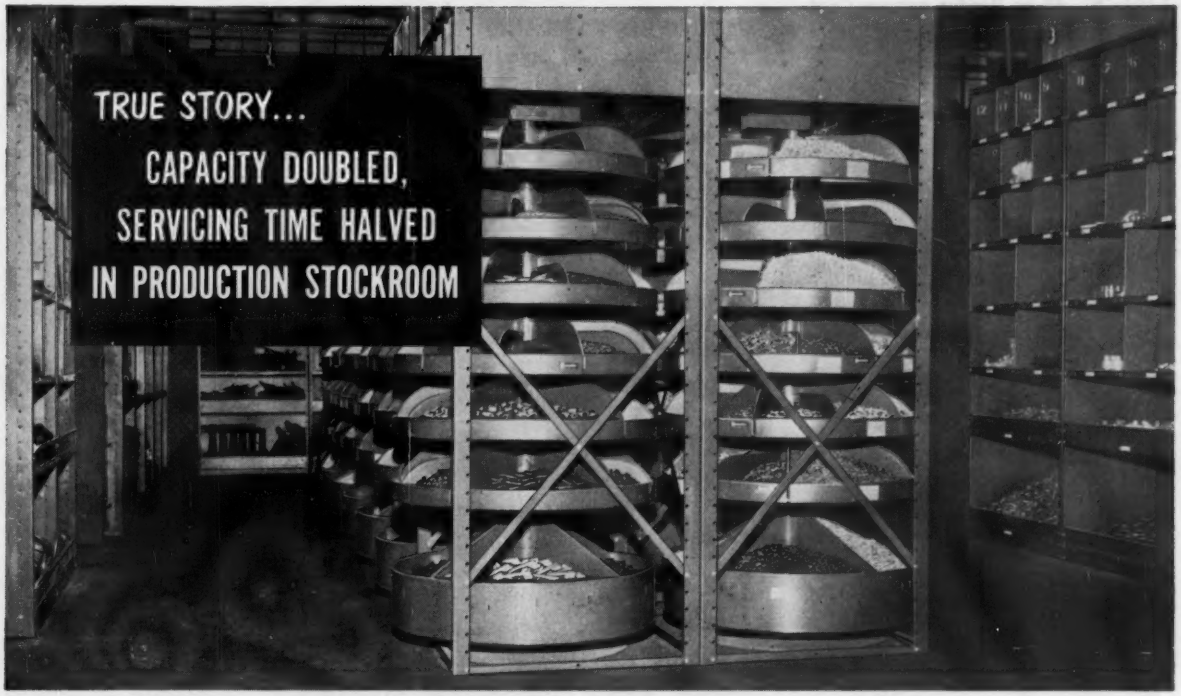
One approach is the performance of management surveys of contractor packaging operations. These surveys can be supplemented by arranging for special analyses of actual unit packaging costs on a selective basis. Our proposal for obtaining unit packaging cost information can be outlined as follows:

1. AF request for unit packaging cost.
2. Information limited to selected items.
3. No revision to present accounting and pricing methods.
4. Cost data susceptible to evaluation.
5. Cooperation with industry.

The Air Force will request actual unit packaging cost information for a selected number of items. The particular items selected for such study could be confined to any of the following: (a) where it is believed that packaging is unusually costly; (b) where comparison is desired with the packaging prices of contractors specially equipped to perform this work; (c) where comparison is desired with standard packaging costs which have been established by our Air Force Depots; (d) where a major change in packaging design is contemplated; (e) where the contractor himself desires to justify the use of a more economical package.

You may wonder how economies derived from these studies of packaging costs will actually affect prices. The mechanics for establishing revised prices is dependent upon the pricing system and type of contract involved.

Now, we understand the basic problems and difficulties involved in determining actual packaging costs. The proposal set forth in this article may not be a panacea for these problems. It will, however, be an initial step in the right direction. Its success depends upon the cooperation that will be received from industry.



New ideas, fitted to each storage job, return large savings

To provide part of the space for an additional assembly line, a large Ohio manufacturer was forced to reduce the production storage area by 20%.

With the help of F-G-M, the reduced-area stockroom stores more than the previous one and services it far more efficiently.

1. In the reduced area, binable items are stored in less than half the space previously used.
   Space is available for reserve stock, palletized items formerly stored in another building.
2. Over half the items are within 20 feet of the issue window, greatly shortening time required for issuing and receiving material.
3. Except for one day's overtime for four employees, the move was completed during regular working hours.
4. One man, instead of two formerly required, now easily operates the stockroom.
5. Ample provision is made for expansion, and the clean, orderly arrangement is an incentive to good housekeeping.
6. Savings in time and space will quickly pay for the complete installation.

A look into your own storage condition may effect comparable savings for you. Send for your copy of "How to Double Your Warehouse Capacity."

The Frick-Gallagher Mfg. Co., Inc.,
105 So. Michigan Ave.,
Wellston, Ohio.

FGM

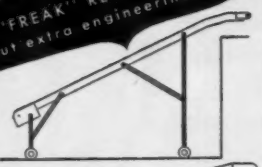
"KNOW-HOW"
. . . increases storage capacity
. . . reduces servicing time

Circle No. 33 on Reader Service Card for more information

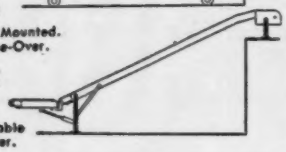
Circle No. 69 on Reader Service Card

22 MODELS
COST-CUTTER
CONVEYORS
Meet "FREAK" REQUIREMENTS without extra engineering cost

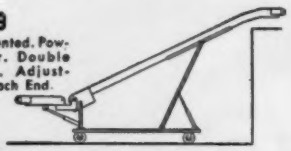
3 of 22 DESIGNS



TYPE 20
Four Wheel Mounted. Double Nose-Over.



TYPE 22
Double Nose-Over and Adjustable Power Feeder.



TYPE 19
Caster Mounted. Power Feeder. Double Nose-Over. Adjustable At Each End.

• Aluminum or Steel • Electric or Gasoline
• Belt Widths 8" to 24" • Lengths 4' to 40'

IMPORTANT! Every Cost-Cutter is Set Up and Test Run in our plant to assure Proper Performance.

Send for BULLETIN 103

NEW LONDON ENGINEERING CO.
TEL. 424 • DEPT. F • NEW LONDON, WIS.

IMPROVED PACKAGE . . .

(*Continued from page* 106)

is considerably less than that of the old containers. Because we ship to our own laminating plants, as well as to customers, we re-use many of our containers. This would be economically unfeasible if it were not possible to knock-down boxes for return trips.

2. *Low Container Cost*—The lost cost of the wirebound box permits it to be used as a one-way shipper where re-use is not desirable or necessary.

3. *Space Savings*—Boxes are supplied to us knocked-down. Therefore, we can store a good supply of them in a small amount of space.

4. *No More Box Shop*—Formerly, we had to maintain our own box shop to construct shipping containers we used. Problems of scheduling output of the shop, so that it kept pace with manufacturing schedules of our plant, were many. And, of course, much valuable space was devoted to the box shop. Now, our boxes are delivered to us, as required, and all ready for packaging.

5. *Easier Roll Removal*—Users of the foil have been unanimous in their praise of the new container, primarily because of the ease of removal of rolls. In the user's plant a filled box is simply spotted near the machine where the foil is to be used. The two vertical straps, the cover and the top two end-pieces are removed. A mandrel is slipped through the core of a roll and it is easily hoisted out of the box and into the machine.

6. *Flexibility in Use*—It is not necessary that a box be completely emptied once it has been opened. Any number of rolls may be removed and the box can be re-closed and returned to storage. Because of the strength provided by the cleats on the mat, heavy end-pieces, and wirebound construction, a partially empty box can be stacked without fear of damage to the remaining rolls.

How to CONQUER SPACE!
and dust . . . and time

SELF-STACKING
CONVOY TOTE BOXES

Stack ceiling high, conserving limited floor space. No intermediate shelving or supports needed.

They quickly interlock and seal the top opening as one is tiered above another. Blind hand grips available if complete dust seal is desired.

SHOWN HERE, STYLE HS-C

DURABILITY—Thousands have been in active use for over four years. Moisture will not weaken them. They are impervious to machine oils. They have armored rims for rigidity; and strong, comfortable hand holes.

MATERIAL—Our exclusive chemical impregnation process transforms high-test, corrugated fibre-board into flint-hard and rock-strong "CHEM-BOARD".

PRICE AND WEIGHT—50% to 60% less than steel. No maintenance expense. It is economical to order them fitted to your job. Weight averages under 6 pounds per cu. ft. of capacity.

Write for illustrated catalog and price list.

Standard and Custom Made Nesting • Stacking • Vertical Tote Boxes for Industrial Use

CONVOY, INC.
P. O. Station B, Box 216-F
CANTON 6, OHIO

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PAK - RAPID INC.

Machines for Parts Packaging

The PAK-RAPID intermittent motion principle gives you these important advantages:

1. Solves short run packaging problems.
2. Gives best possible seals.
3. Provides faultless product feeding.
4. Allows easy adaption of auxiliary counting and feeding equipment.
5. Meets industrial and military printing and packaging requirements including AUTOMATIC AIR REMOVAL.

Performance: Packages single or multiple items—whether fragile or durable, even or odd shaped, oily or dry, up to 1¼" thin . . . using all flexible heat sealing materials except unsupported plastic films.

Portable—operates on 110V A. C.

Your inquiries are invited. Contact our representative nearest you or write us direct.

PAK-RAPID INC.

INCORPORATED 1945
Builders of fine packaging machines.
18 Elizabeth St. • W. Conshohocken, Pa.

PAK - RAPID INC.

Circle 102 on Reader Service Card for more information

An open-and-shut case . . .

Mr. John Bartyzel, Warehouse Superintendent at the Consolidated Cigar Co., Glastonbury, Conn., says, "At six vital points in the warehouse, Stanley Magic Eye Controls save valuable time by opening and closing heavy doors automatically. Our operators stay on the truck and on the job."

In this warehouse, the *instant* opening and *positive* closing of the doors serves another purpose—protecting the crop in storage against the entrance of ruinous smoke. Whatever *your* specific door opening and closing problem, you, too, can rely on Stanley Magic Door Controls as the *automatic* solution.

FINE for speeding up traffic flow

STANLEY *Magic Door* CONTROLS

When it's a case of speeding up traffic flow in plant, warehouse or office, the verdict is always in favor of Stanley Magic Door Controls — Magic Eye® (photoelectric) or Pull Cord.

And the case for Stanley Magic Door Controls is just as airtight, whatever your requirement . . . *conserving conditioned air, controlling temperature and humidity, reducing damage to doors and equipment or improving working conditions!*

Write for complete information about Stanley Magic Door Controls. Call in your nearby Stanley Magic Door Representative (without obligation). He's listed in the yellow pages of your telephone directory.

MAGIC DOOR DIVISION, THE STANLEY WORKS
Dept. A, 595 LAKE ST., NEW BRITAIN, CONNECTICUT

STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS • STANLEY STEEL STRAPPING • STANLEY STEEL

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Circle No. 68 on Reader Service Card

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MANUFACTURERS SINCE 1932
QUALITY
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SHELVING
AND
STEEL SHOP
EQUIPMENT

Dealers' and Agents' Inquiries Invited
Write DEPT. A

NEIMAN STEEL EQUIPMENT CO., Inc.
BALFOUR and VENANGO STS., PHILA. 34, PA.

CEMA Names New Officers

New officers elected by the Conveyor Equipment Manufacturers Association, at its recent 23rd Annual Meeting, are shown above. They are: (front, left to right) J. H. Walker, president; E. E. Boberg, past president and director; A. W. Rich, vice president; R. C. Sollenberger, executive vice president. (rear, left to right) L. J. Johnson, director; J. C. Webb, retiring director; H. E. Murken, treasurer; J. B. Nordholt, Jr., secretary. Other directors not shown are F. J. Shude and R. Y. MacIntyre.

ON-TIME MAINTENANCE MEANS:

- Better Performance
- Fewer Repairs
- Less Down Time
- Longer Equipment Life

HOBBS
Engine Hour
METERS

Take the guesswork out of protective maintenance! Know WHEN it's time to change oil . . . replace filters . . . lubricate . . . overhaul, etc.

The HOBBS Engine Hour Meter is an accurate electrical timing instrument which records HOURS and MINUTES of running time of all types of powered equipment . . . tells WHEN maintenance is due. Not a revolution counter. Two models — direct-reading (upper illustration) and pointer type. Ruggedly built . . . easy to install . . . low in price. See your factory branch, representative or distributor . . . or WRITE:

John W. Hobbs Corporation
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A Division of Stewart-Warner Corporation

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RUBBER ROLLERS
FOR
CONVEYORS

- Provide Cushioned, Scratch Free Rides
- Suitable For Finished Stampings, Glass, Plexiglass, Etc.
- Used For Die Lifters, Hydromatic Welders, Gravity Roll Conveyors, Etc.

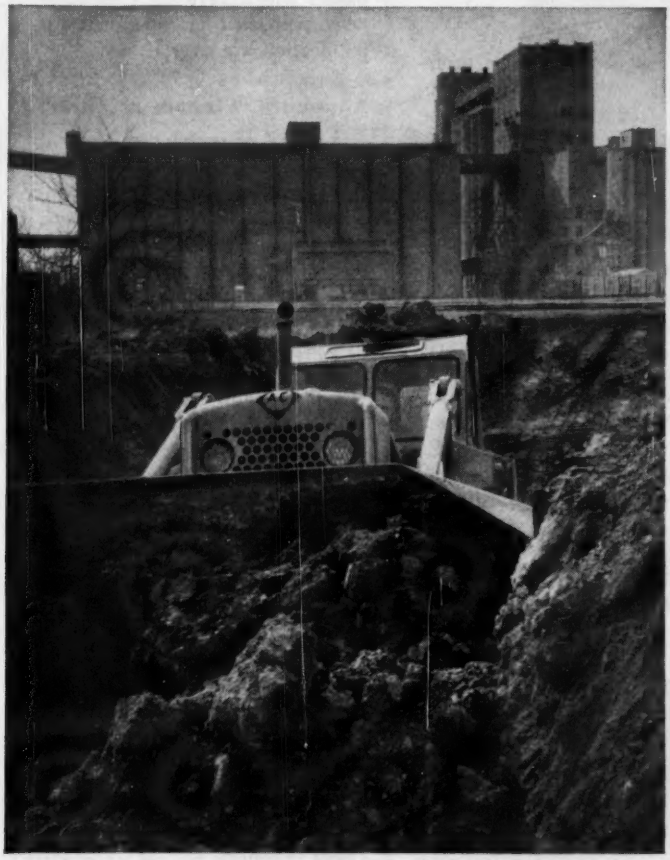
FIVE MODELS — THREE DENSITIES
4" DIA.—2" WIDE 2½" DIA.—2" WIDE

DUAL BALL BEARING ALLOY AXLE—
SELF LOCKING NUT
ALL PARTS INTERCHANGEABLE
WRITE FOR FURTHER INFORMATION

STILSON TOOL, INC.
30229 GROESBECK HWY.
Ph. Prescott 8-2010, Roseville, Mich.

Circle No. 135 on Reader Service Card

Staley solves waste disposal problem with an Allis-Chalmers tractor shovel



Cuts the trench. The first step in Staley's landfill system is to cut a trench. Their Allis-Chalmers HD-11G, with 111 net engine hp and a large-capacity hydraulic system, easily handles tough excavating. It is also mobile enough to carry excavated material to conveniently located stockpiles.

Adopts highly successful landfill system

Most plants have one by-product and one problem in common. The by-product is waste and the problem is how to dispose of it. Staley Manufacturing Company, Decatur, Illinois, disposes of both the waste and the problem with an Allis-Chalmers HD-11G tractor shovel.

By adopting the sanitary landfill system, this large manufacturer of soybean and corn products now disposes of refuse quickly and cleanly. There are no unsightly dumps . . . no hillside "smudgepots" . . . no breeding places for insects and rodents. Further, the system requires a minimum of man power and equipment. This picture story describes how one Allis-Chalmers HD-11G tractor shovel handles Staley's three-step landfill operation.

• • •

This versatile machine can help solve your waste disposal problem—and double as a material handling and yard maintenance machine. Write for free literature on all four sizes of tractor shovels from 1½ to 4 cu yd, or see your Allis-Chalmers construction machinery dealer.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Spreads and compacts refuse. A truck dumps refuse at the head of the trench. The HD-11G then pushes or carries refuse with the bucket and spreads it in the ditch. Utilizing its 32,000 lb of weight, the crawler tractor compacts the material to a small fraction of its original volume.

Seals it in forever. At the end of each day, the tractor shovel takes dirt from stockpiles—2¼ cu yd at a pass—and spreads it over compacted refuse, leaving smooth, clean, level land. In many cases, useless lowlands have been reclaimed by the landfill system and later put to valuable use as playgrounds or building sites.

Circle No. 104 on Reader Service Card for more information

AMHS Reveals Theme for 5th Annual CLARK Awards Contest

THE American Material Handling Society has revealed that the theme of the Fifth Annual Clark Awards Contest is "Outdoor Material Handling and Storage".

Entries may include any phase of outdoor material handling, according to AMHS. All members of AMHS and students of material handling are eligible to participate. Five cash prizes will be awarded, totaling $5000, with first prize of $1000 and subsequent awards of $500, $250, $150 and $100. All remaining entries will receive a certificate of proficiency.

Outlines Prerequisites

The association has outlined the following prerequisites of a good paper, as a guide to persons who wish to submit entries:

(1) It must treat some project or subject of interest to a large group of readers.

(2) It should define the problem clearly.

(3) It should offer a discussion or a solution of that problem.

(4) It should give briefly some explanation, proof or other evidence supporting the solution.

(5) The language should be understandable to the engineer who is not a specialist in that field, but who may be interested in it.

All papers must be postmarked before midnight, March 25, 1957, and should be addressed to: AMHS National Chairman, Honors & Awards Committee, M. E. Richardson, c/o Standard Conveyor Company, P.O. Box 848, Decatur, Georgia.

While there is no restriction in the length of entries, it is pointed out that average papers in the past have been between 2000 and 3000 words. Each paper will be judged according to analysis of the subject, value in its field, originality, organization and arrangement of material, and visual aids. Only papers which have not previously been published or submitted for publication are eligible.

Announce Winners at Show

A board of review composed of the AMHS Honors and Awards Committee and eminent educationalists will select the prize papers. Announcement of the winners and presentation of the awards will be made at the Annual Board Meeting and Banquet, during the week of April 29, 1957 in Philadelphia, during the 7th National Material Handling Show and Conferences.

The Annual Clark Awards Contest is made possible through a grant by the Material Handling Division of Clark Equipment Company. It was established to create and stimulate creative thinking by AMHS members and students of material handling.

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ECONOMICAL • FLEXIBLE
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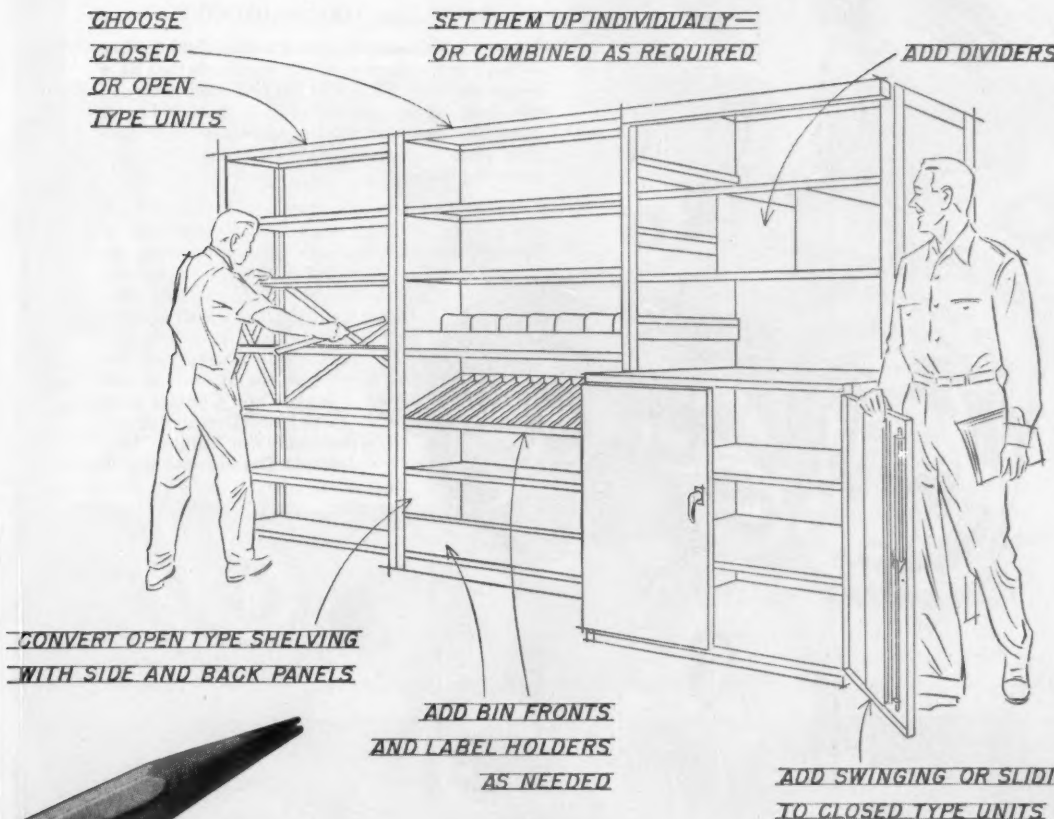
GO-GETTER
The MOST COPIED
LIFT TRUCK
On The Market
EASIEST WALKIE-TRUCK TO OPERATE AND MAINTAIN EVER!
FINGER-TIP CONTROLS, INCLUDING DYNAMIC BRAKE TO ELIMINATE "PLUGGING" THE MOTOR GOING DOWN RAMPS, AND "ARTICULATED" CONSTRUCTION ADJUSTS TO UNEVEN FLOORS, STEERS EASILY, AND WORKS IN LESS SPACE BECAUSE OF THE DUAL WHEELS & DIFFERENTIAL DRIVE!
HOW ABOUT MAINTENANCE?
SNAP THE LATCH AND LIFT OFF THE COVERS - YOU DON'T EVEN TAKE THE MOTOR OUT TO GET AT THE BRUSHES, AND THE DISK BRAKE HAS A SIMPLE SCREW ADJUSTMENT
WRITE FOR OUR FREE TRUCK INDEX OF GO-GETTER ELECTRIC AND RED GIANT HAND LIFT TRUCKS
REVOLVATOR CO.
8715 Tonnele Ave., North Bergen, N. J.

Circle No. 76 on Reader Service Card

HOW TO USE HALLOWELL ADJUSTABLE SHELVING IN PLANT MODERNIZATION


CHOOSE CLOSED OR OPEN TYPE UNITS
SET THEM UP INDIVIDUALLY— OR COMBINED AS REQUIRED
ADD DIVIDERS
CONVERT OPEN TYPE SHELVING WITH SIDE AND BACK PANELS
ADD BIN FRONTS AND LABEL HOLDERS AS NEEDED
ADD SWINGING OR SLIDING DOORS TO CLOSED TYPE UNITS

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HALLOWELL SHOP EQUIPMENT DIVISION
STANDARD PRESSED STEEL CO.
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Now available to industry for the first time:

a
2-speed hoist
built to
P&H quality
standards

the P&H 2-speed HEVI-LIFT

(capacities 1,000 to 10,000 lbs.)

Here is a 2-speed hoist with unmatched quality — built to the same exacting standards that have made the P&H Hevi-Lift the accepted leader in the field of heavy-duty electric hoists. Faster hoisting speed with accurate slow-speed spotting that gives better control, is only one of its outstanding features.

Your Hevi-Lift also offers a new control cabinet design, effecting significant economies in lowered maintenance and providing easy access for visual inspection. Other "extras" standard with P&H include anti-friction bearings, a dual-gear train that assures a balanced drive, plus *shaved gears* for quieter operation and longer life. Contact your P&H Hoist Distributor and write today for bulletin H-5. Address Department 200-F.

HARNISCHFEGER
P&H INDUSTRIAL DIVISION
...waukee 46, Wisconsin

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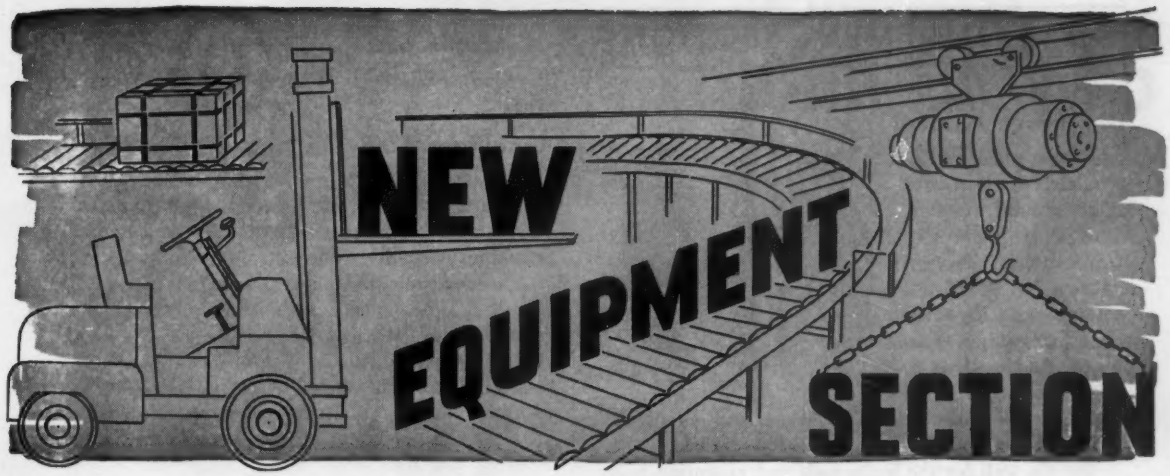
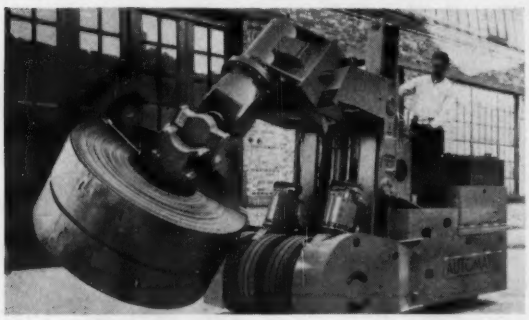


Rotates Coils in Any Position

A heavy ram truck attachment offered by Automatic Transportation Company can lift a steel coil in either

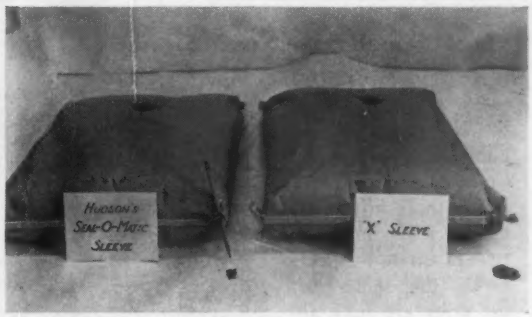


vertical or horizontal position and rotate it to the opposite position, eliminating the need for a separate up-ending unit. The attachment is available on Automatic HR trucks, in capacities from 10 to 30 tons.

Circle 258 for more information

Multiwall Features New Closure

An automatic valve closure said to virtually eliminate sifting in mutliwall bags has been developed by



Hudson Pulp & Paper Corp., for exclusive use in its sewn-valve multiwall sacks. The Seal-O-Matic Sleeve is designed to protect against sifting in loading of pulverized, granular, crystal and pellet type products.

Circle 260 for more information

Miniature Vibratory Feeder

A new miniature Hi-Vi electro-permanent magnetic vibratory feeder, the FE 1/4, has been introduced by Eriez Mfg. Co. The tiny new model weighs a scant

seven pounds, and is designed for extremely accurate feeding operations where small amounts of materials are involved. It operates directly off of an AC line.

Circle 259 for more information

New Line of Parts Boxes Available

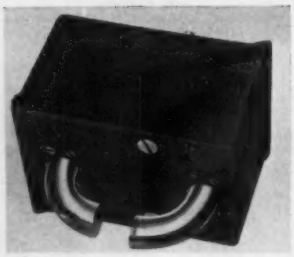
The Chas. Wm. Doepke Mfg. Co., Inc. has introduced a complete new General Purpose line of NesTier material handling boxes. The units are similar

to the Heavy Duty boxes, but are light enough to be hand carried by female workers. Lengths range from 12 to 36 inches, with capacities up to 1200 pounds.

Circle 261 for more information

NEW EQUIPMENT SECTION

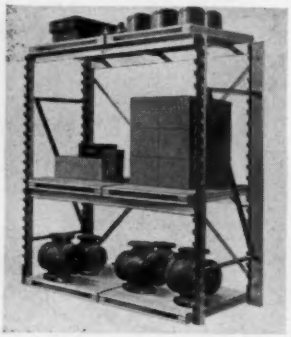
Bin Level Control



Through use of lucite rods to conduct light around corners, The Autotron Co. states that its new Autotron No. A-135-134 Photoelectric Control Unit brings new reliability and simplicity to bin level control of granular materials, flakes, powders and small dry solids of all kinds. Installation merely requires slots in the bin wall for the lucite rods and mounting holes for attaching the A-135 sensing head. All parts, even the lucite rods, are accessible and removable without disturbing the mounting.

Circle 262 for more information

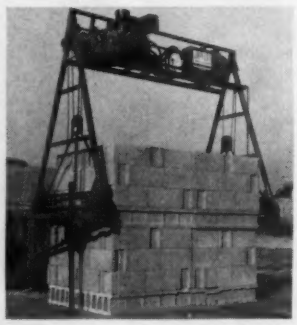
Saves Time, Space and Money



Adjustable pallet racks, manufactured by Hartman Metal Fabricators, Inc., save time, space and money due to their adjustability, says the manufacturer. Called Flexi-racks, the shelves of the units are fully adjustable, up and down, in and out from section to section—in seconds. A lift truck moves the shelf and load without the driver leaving his seat. The rack is easily assembled and disassembled without tools, millrights, or mechanics. The unit is safe and rugged—and all connections are positive and capable of any weight load, states the manufacturer.

Circle 263 for more information

Triple Deliveries



The Jiffy loader and unloader for concrete blocks, brick, cement, stone, etc., is said to triple deliveries during seasonal demand and to pay for itself in four months or less, according to the manufacturer, Elberfeld Mfg. Co., Inc. The unit can be operated by one man from either side of the truck, can handle 10,000 pounds with ease, has 4 wheel drive and 4 cable suspension which eliminates swinging, is easily installed, sturdily built and all parts are standard items of quality makers.

Circle 264 for more information

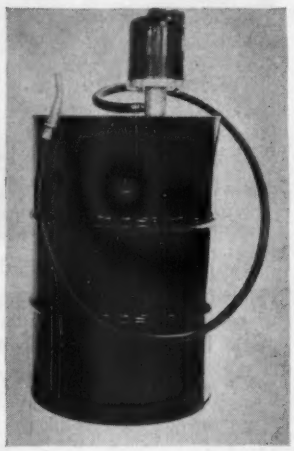
Combines Many Lifting Operations

A new mutli-purpose Lift and Drum Stacker has been introduced by The American Pulley Co., for use in plants or departments requiring occasional drum stacking in combination with other lifting operations.

The new unit combines forks, platform and drum-handling attachments with a basic pedal-operated, straddle-type lift truck. For regular use, the forks will lift a 1000 pound load 68 inches. When the need arises, a steel platform is slipped over the forks, to provide a portable loading platform or elevator for small or bulky containers. Still another use is provided by removing the four bolts which secure the forks, and replacing the forks with a drum-stacking attachment capable of lifting steel or fibre drums weighing up to 500 pounds.

Circle 265 for more information

Sanitary Drum Pumps



Mallet & Co. has introduced a group of new, sanitary drum pumps which are designed to reduce the excessive labor, time and cost incurred when drums are emptied by hand. The new series is highlighted by the heavy-duty, electric Mallet Sanitary Drum Pump which can transfer such ingredients as compound greases, jelly, corn syrup and other heavy food products at rates up to 25 pounds per minute without waste and contamination. Constructed of sanitary stainless steel and aluminum, the pump is mounted on a lid which will cover any 55-gallon open-style steel drum. It is available also for use with odd sized drums.

Circle 266 for more information

Air-Operated Tape Dispenser

A new series consisting of four models of air-operated tape dispensers is manufactured by Air Fixtures, Inc. There are models to accommodate filament, glass fibre, colth, paper, plastic, cellulose and acetate fibre tapes, in rolls up to 4 inches wide and 9 inches in diameter. When the operator removes a strip of tape from one of these air-operated dispensers, a micro switch automatically sets in motion the next delivery cycle. According to the manufacturer, this gives the operator free time to do other operations while the tape is being delivered.

Circle 267 for more information

LORAIN CRANES

Make this NEW method possible

Today, outside storage and warehousing is the big, modern move in American industry for two reasons—(1) outside storage space is very economical, with square-foot costs about 1% of equivalent enclosed building areas and (2) modern, rubber-tire cranes, like Lorains, possess the features that make it possible to service such areas rapidly, efficiently and economically to reduce material handling costs. In this case, illustrated, an electric refrigerator manufacturer licks his material handling costs and problems in handling heavy bundles and coils of strip steel with a 15-ton Lorain Self-Propelled Crane.

Dollar savings add up quickly when a Lorain Crane goes to work on such material handling operations. Reasons for these important savings are listed below . . . reasons why "you need a Lorain if you have a storage yard." Check them —and check further with your Thew-Lorain Distributor for specific facts and figures.

SAVE AISLE SPACE — Long booms reach out farther to store materials in hard-to-reach areas . . . fewer aisles needed . . . fewer moves.

SAVE YARD SPACE — Long booms reach higher to permit higher stacking . . . permit more storage volume per square foot.

SAVE EQUIPMENT EXPENSE — Multiple purpose Lorains easily switch loaded railroad cars, push or pull loaded trailer trains.

SAVE ON EXTRA JOBS — There are more than 16 types of attachments such as hooks, clamshells, grabs and magnets to handle a wide range of materials of any size, shape or type. Further, you get "bonus" jobs on construction, maintenance and erection work around your plant.

SAVE ON EFFICIENCY — Lorains give the same high efficiency 24 hours a day, 7 days a week — good weather or bad.

SAVE MANPOWER — A Self-Propelled Lorain releases manpower for productive operations. One man does the work of a "gang."

SAVE TIME — Mobile, fast-stepping Self-Propelled Lorains are not "chained to tracks." Can serve all parts of your yard — or two or more nearby yards — quickly, efficiently. Don't require expensive, paved roadways. Speeds up to 15 mph.

A LORAIN CRANE TO FIT EVERY YARD AND NEED

The completeness of Lorain selection is an advantage in fitting your needs. Available are Self-Propelled Cranes of 7 to 35-ton capacity; 2-engine Moto-Cranes up to 75 tons; crawler models in capacities up to 60 tons. Your Thew-Lorain Distributor will be glad to analyze your material handling and storage problems and recommend the right size and the right mounting to save time and money for your company. Call him today.

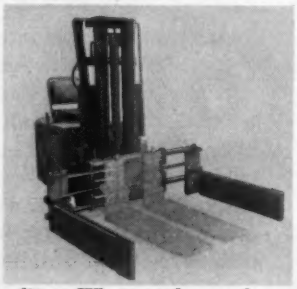
THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

Circle No. 121 on Reader Service Card for more information

NEW EQUIPMENT SECTION

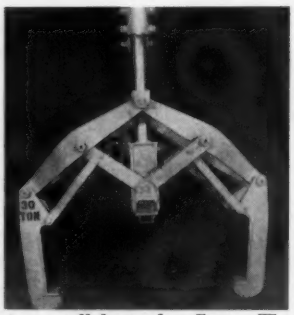
Forks Convert to Clamps



Lewis-Shepard Products, Inc. has announced that its complete Master line of electric fork trucks is now available with the Cascade clamp and Grip-O-Lift arms. This attachment may be used either as forks for handling pallets, or as a clamp for palletless handling. When used as a clamp, the arms may be adjusted to carry loads having widths from 16 inches to 63¾ inches. The arms are lined with rubber, and are equipped with an adjustable pressure relief valve to prevent crushing the load. All controls are located in one area directly adjacent to the driver's seat. Conversion from forks to clamp arms is accomplished simply by rotating the arms 90°.

Circle 268 for more information

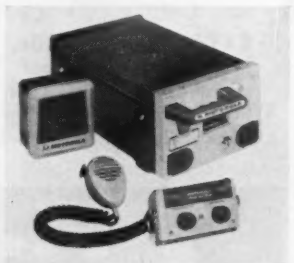
Motorized Tongs



An electric motor, controlled by the crane operator, opens or closes the arms of a new type of motorized horizontal coil tongs designed by Heppenstall Co. The linkage is such that the arms are parallel to each other at all times, and certain models will rotate the coil keeping the axis parallel to the floor. The tongs shown have a capacity of 30 tons and will lift coils up to 76 inches wide. Tongs of other capacities are available.

Circle 269 for more information

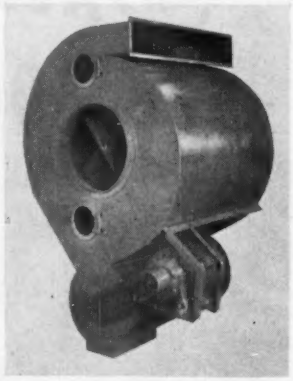
Interference Free Communications



A radiophone claimed to utilize an entirely new circuitry concept to effectively provide private interference-free mobile communications has been developed by Motorola Communications & Electronics, Inc. Called Private Line, the manufacturer states that it is specially designed to maximize communications efficiency under congested channel conditions. It eliminates operator fatique, missed and misunderstood messages and passenger annoyance. In this radio system the mobile operators and the associated dispatcher hear only those calls transmitted within their own operation.

Circle 270 for more information

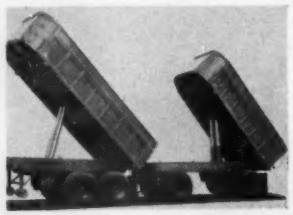
Pneumatic Conveying



Being manufactured by The Cardwell Machine Co. is an improved device for pneumatic conveying. Called "The Cardwell Tangential Separator", it has been used extensively in the tobacco industry and is now being introduced for handling dry and semi-dry fibrous materials like woodchips, sawdust, woodflour, dust and paper broke. Some of the advantages of the unit over standard type cyclones, collectors and open conveyors are: compactness, easier maintenance, wider range of sizes up to 12,000 CFM. All material is separated down to 30 microns and temperature of the product through the Tangential Separator is not affected, since air is exhausted at a fast rate.

Circle 271 for more information

Hydraulic Trailer Dump



A new tandem axle trailer dump for use with single axle tractors and equipped with a self-powered hydraulic hoist, is being manufactured by Galion Allsteel Body Co. Designated Model STM (SP), the unit is designed for materials hauling used in mixed fleets. It is fitted with a complete hydraulic system including an auxiliary engine, hydraulic pump, spool type control valve and hydraulic oil reservoir. According to the manufacturer, the new trailer dump minimizes dispatching problems and reduces equipment investment in mixed fleets. Any conventional tractor can be used with the self-powered trailer dump.

Circle 272 for more information

New Versatile Conveyor

Hytrol Conveyor Company has introduced a new lightweight, all-purpose conveyor, featuring a bed made of heat-treated aluminum, adjustable tension belt with reversable movement, and a full complement of attachments. The Hytrol Handy-Boy Model A conveyor is available in eight sizes, from 6 to 20 feet in length. Hinged mounting brackets permit the unit to be tipped on its side when not in use.

Circle 273 for more information

Build with new, low-cost DEXION Slotted Angle

WORK TABLE

GOODS CART

STORAGE RACK

No drilling or welding! No waste! Just cut DEXION and bolt the frame you want in minutes!

All you need is a DEXION Cutter and a wrench to transform this precision-made, cold-rolled, galvanized steel angle into practical, useful, economical equipment used almost anywhere in your plant, warehouse, store or office.

Scientifically spaced slots and holes make it easy for you to build an infinite variety of structures. And almost anybody can assemble DEXION. There's no confusing array of tricky parts to cope with.

To save time, work and materials, there's nothing like DEXION. You can use it over and over—it never wears out.

DEXION CUTTER

The secret of DEXION'S fast assembly is the special DEXION CUTTER. One quick downstroke gives you a clean, accurate edge.

DEXION PANELS, CASTERS

Use DEXION panels for shelving or tables. Will support heavy weights. Bolt easily to any DEXION frame. Casters make frame movable.

DEXION Slotted Angle is a packaged product, ten pieces to the package, 10 or 12 foot lengths. Two sizes: 3″ x 1½″ x .104″ and 2¼″ x 1½″ x .080″.

Write today for free DEXION folder, dept. FDD-17, DEXION Division, Acme Steel Company, Chicago 27, Illinois, and for the name of your nearest DEXION office or distributor.

ACME STEEL DEXION SLOTTED ANGLE

Circle No. 125 on Reader Service Card for more information

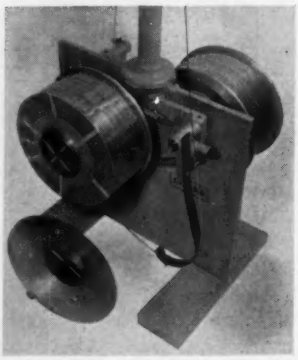
NEW EQUIPMENT SECTION

Steel-Clad Platen Conveyors

A new Conveymatic Carrousel platen conveyor has been built by Visi-trol Engineering Co. These steel-clad "traveling benches" are ideal for assembly, inspection or light machining operations. They are obtainable in lengths up to 100 feet, in ten-foot multiples. They feature automatic accurate indexing, and adjustable dwell for work cycle. Working height is 38 inches, adjustable up or down two inches. The 10 x 12 inch platens support up to 100 pounds, and may be drilled and tapped to customer specifications. Power is supplied by a Visi-trol hydraulic indexing unit, which operates at 800 psi and is driven by a 2 hp motor.

Circle 274 for more information

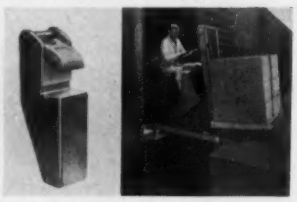
Designed to Speed Stitching Operations



Occupying slightly more than two square feet of floor space, the new Inland 50 pound Stitching Wire Coil Holder will accommodate two coils—one in operation and one on standby; downtime for changing coils and threading is thereby reduced. Operation of the stitching machine is further aided by a positive brake action which prevents tangling of wire by keeping the wire under the proper tension. The coil is placed on the spindle with only a short lift, and locked in place by a twist-lock cover. An adjustable wire-feeding arm provides easy alignment with stitching machine. The unit is manufactured by Inland Wire Products Co.

Circle 275 for more information

Protects Against Dockboard Slippage



The Adjustable Span-Lock, a device which helps lock dockboards in position between dock and rail car or truck, has been introduced by Magnesium Company of America. Span-Locks can be positioned anywhere on the dockboard, without the need for tools. A lever arm locks the jaws in position, and the bottom of the device extends down into the span between dock and carrier, fitting snugly against the edge of the dock.

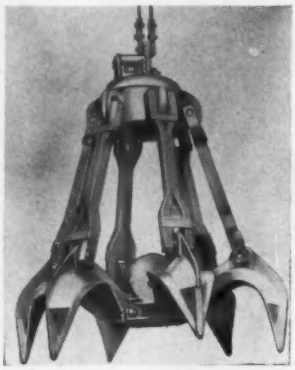
Circle 276 for more information

Versatile Portable Floor Crane

Stratton Equipment Co. has begun production of a new Thrift Model of its Hydro-Crane hydraulic portable floor crane. The new model is available in 1, 2, and 3 ton capacities, and is complete with safety plunger foot brakes, adjustable legs for straddling large objects, and a safety release valve that automatically prevents overloading. A new sliding extension beam provides 39 inches of additional lifting length or height, and is adjustable to three different positions.

Circle 277 for more information

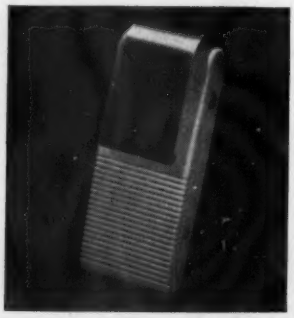
Tines Are Independent of Each Other



Ruhr Industries has introduced the Ruhr Model M-1 grapple, in capacities from .33 to 3.3 cubic yards. The M-1 has five, six or eight tines, depending on its size, and each tine is independent of the others, and can be positively operated like the fingers of a giant hand to wriggle and dig deep into object or material. Final resistance is met with a grip up to 50 tons—five times the weight of the grapple. Hard faced points are provided for resistance to abrasion, and wear plates of magnesium are available for heavy models.

Circle 278 for more information

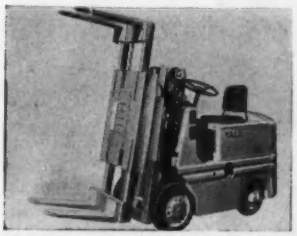
Paging by Short Wave



Short wave radio transmission is utilized by the Pagemaster selective radio paging system, manufactured by Stromberg-Carlson Division of General Dynamics Corp. Instead of conventional voice or speech, combinations of tones are sent out over the radio waves. Each receiver is sensitive to a different tone, providing selective paging. The system consists of transmitter, encoder and receivers. The receivers are small enough to be tucked into a shirt pocket, and are powered by batteries which last approximately 1400 hours. The user hears nothing unless his call is being transmitted.

Circle 279 for more information

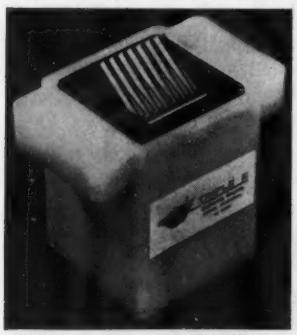
Forks Can Be Used for Clamping



The Yale & Towne Manufacturing Company has announced a heavy duty, dual purpose, rotating industrial lift truck attachment which will permit the truck to double as a standard lift truck or as textile or paper bale handler. The attachment uses two sets of 8-inch wide forks, mounted on opposite sides of the fork carriage for clamping surfaces. Used as a clamp, it can securely pick up, lift and carry bales from 27 to 75 inches wide. The 360° rotating characteristics of the fork carriage permits either horizontal or vertical placement of the load. On a 5000 pound capacity truck, the new Yale fork-clamp can handle loads up to 3200 pounds at a 24 inch load center.

Circle 280 for more information

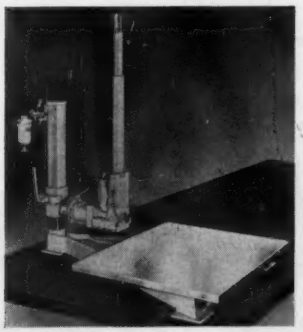
New Can Coder Announced



The Data Line—a new can coding instrument featuring a radical departure from present methods of code marking—has been introduced by Triple-E Engineering Co. Fifteen spring-loaded carbide blades mark metal cans with a series of inconspicuous scratches as the cans pass over the blades on the conveyor line. The blades are selectively used and rapidly actuated by allen-head screws. The versatile binary numbering system is employed in setting the blades, to provide a wide variety of information such as date of filling, plant, line and batch number, etc. A small coding card can be placed alongside the scratches to translate this information at a glance.

Circle 281 for more information

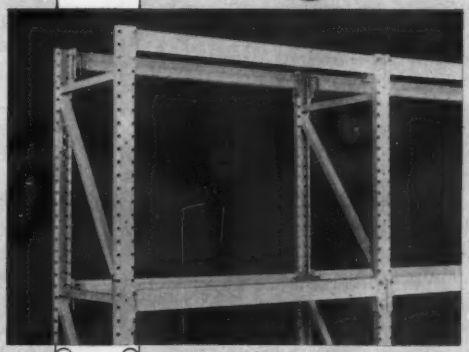
Adds Bench-Model Stapler to Line



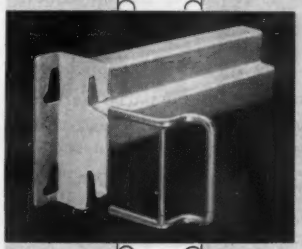
A carton-closing stapler that mounts right on existing bench or work surfaces is the newest addition to the International Staple and Machine Co. line of carton-closing stapling machines. The new stapler is compact in size and, according to the manufacturer, easy to adjust. The stapling head can be turned to a horizontal or a ver-

speedrack
PATENTS PENDING

a new dimension in material storage



AN ENGINEERED PRODUCT WITH VERSATILITY TO FIT YOUR NEEDS



RIGIDITY INCREASES WITH LOADING
FOR PALLETS, SKIDS, DIES, HAND STORAGE
LOW INITIAL COST
LOW ERECTION COST
NO BOLTS OR NUTS
INSTANT ADJUSTABILITY

Write Today for Complete **speedrack** *Information*

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Circle 148 on Reader Service Card for more information

tical position, for stapling in either direction. The unit has a table size of 19¼ by 24⅛ inches. Releasing a lock lever permits stapling at any height from 0 to 15 inches.

Circle 282 for more information

Manual or Drag-Line Platform Trucks

A new line of 4-wheel platform trucks, for either manual or drag-line operation, has been announced by Nutting Truck and Caster Co. Replaceable hardwood decks, kiln dried to prevent warping and checking, are braced beneath with steel angle and enclosed by welded frames. All casters are attached by bolts and locknuts, to provide easy removal. Six or eight inch wheels are available, as well as five different types of hitches for powered drag-line operation.

Circle 283 for more information

Low Cost Protective Packaging

The Tekmold Products Plant of the Bemis Bros. Bag Co. is now manufacturing molded cellulose containers for protective industrial packaging. Called Ship Shapes, the new containers are custom made of cellulose pulp. Where over-all protection is required, the containers can completely enclose the item, nesting it between pulp cushions. Where over-all protection is not required, partial protection is provided. Molded caps and headers shield protruding or fragile parts. Tailored inserts hold packaged items in suspension, protecting them from shocks and package puncture.

Circle 284 for more information

Torque Converter Drive Truck

A new 1½ ton capacity industrial truck with torque converter drive has been introduced by The Prime-Mover Co. According to the manufacturer, the new truck has a top speed of 12 mph, with special gear ratios available for higher speeds. It is powered by a Wisconsin air cooled engine, and engine and transmission are coupled to the differential by an automotive type drive shaft. Standard beds available for this Model M30 Prime-Mover include an 18 cubic foot bulk handling bed and a 42 inch square flat bed.

Circle 285 for more information

Rail Supply Car

Basic improvements in the tool and supply car marketed some months ago by the Nolan Company have just been announced. The principal change permits the wheels of the car to clear track jacks when necessary, permitting unhampered movement of the vehicle on the job. This 2000 pound capacity car is of tubular steel construction, and breaks at the center into two sections, for easy handling and transportation of the unit.

Circle 286 for more information

Feeder Increases Hopper Capacity

Feedall, Inc. has begun to produce the Feedall Model 2500B automatic feeder, featuring a hopper with a 45 cubic foot capacity, which makes it possible for one unit to take the place of several smaller ones. The range of work for rolling parts is 5 inch diameter, and 3/16 to 1½ inches long; sliding parts 3/16 to 2 inch diameter and up to 5 inches long. Power is furnished by a 1½ hp 220/440 volt motor, operating through a variable speed drive.

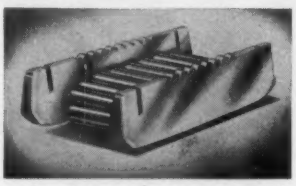
Circle 287 for more information

Versatile New Truck

A new model 7260-D Heavy Truck has been introduced by Toledo Metal Furniture Co. Designed for handling extra-heavy loads such as tools, dies, transformers, newsprint, batteries, etc., the truck is of all-steel construction, and is available with casters or stationary feet. Two or three shelves may be included, as well as a drawer, 14 x 19 x 4 inches. The 14-gauge shelves, 20 x 28 inches, are adjustable and reversible. Overall height is 32 inches. The standard finish is baked enamel, in gray, green, beige or brown.

Circle 288 for more information

For Moving Heavy Machinery



An easy way to move heavy machinery or equipment is provided by the Express Roller, manufactured by the Express Roller Division of Industrial East Company. The units comprises two major components.

A series of moving rollers extend above and below a heavy steel frame, and operate in a caterpillar-like action. The frame, which contains serrated edges, grips and carries the load being carried. Express Rollers are available in five ranges of sizes, with capacities of 2 to 150 tons.

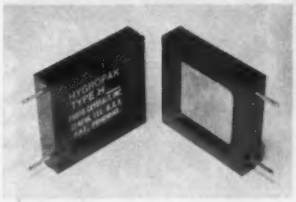
Circle 289 for more information

Double-Coated Tape Without Liner

Adhesives that won't stick together—but hold securely to other materials—have made possible the first double-coated tape without a protective liner, according to Minnesota Mining and Manufacturing Co. The unique property of these adhesives enable "Scotch" brand Double Coated tape No. 665 to be wound on a roll without sticking to itself. This eliminates the liner, making the tape easier and faster to apply than previous liner-equipped tapes. The new linerless tape is available in 36-yard roll lengths, in standard widths from ¼ to 1 inch, with other widths available on special order.

Circle 290 for more information

New Type Humidity Sensing Element



Hygropak, a new type of electric humidity measuring element based on the transistor theory, has been developed by Photo-Crystals Inc. The device employs grid electrodes, coated with a thin film of a special substance which changes its resistance with humidity. By varying this coating, it is possible to obtain elements that vary in resistance from a few ohms to thousands of megohms. Hygropaks may be operated by dry cells or by AC current. They will measure humidity accurately under temperatures up to 200° F for normal operation, or are available in special all glass units capable of operating in temperatures up to 600°F.

Circle 291 for more information

Accurate Industrial Checkweighing

Pennsylvania Scale Company has developed three new over-under speed check scales. The new scales are end tower models, expressly engineered to provide speed and accuracy in commercial and industrial checkweighing operations. The new units are available in capacities of 3, 5 and 10 pounds, and are designated as models D-3, D-5 and D-10 respectively. They are easily portable, with housings of aluminum alloy, and can be read from any eye level. Temperature varia-

18 STANDARD MODELS

Three Standard Fork Lengths
36", 42", 48". Fork widths 20½" or 27".

Standard Capacity
4600 lbs.

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The **PALITON**
Hand Pallet Truck

- **Maximum manoeuvrability: full 180 degrees steering lock.**
- **Easy running: each wheel and roller has two ball bearings.**
- **Full FIVE INCH LIFT • Overloading prevented by pre-set relief valve • Three-way control-raise lower and NEUTRAL, giving a free handle for towing.**

Combined Handle and Pump Lever
Hydraulic Cylinder Easily Serviced
Control Valve for Raise Lower and Neutral
Rubber or Steel Tires
Twin Rollers for Easy Cornering
Rollers Between Fork Arms
Optional Fork Lengths
Light Compact Sturdy Frame

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Circle 86 on Reader Service Card for more information

Swing-Shift
HYDRAULIC FORK CONTROL
SAVES YOU 18% in Operating Costs
SIDE SHIFT
AUTOMATIC
A. C. (BUDA)
CLARK
GERLINGER
HYSTER
ROSS
YALE & TOWNE
BOTH FORKS SWING AND SHIFT
NOW!
FACTORY OR FIELD INSTALLATION KITS
for 3000 to 20,000 lb. Trucks
Swing-Shift speeds carloading up to 28%. Less damage to loads and fragile merchandise.
SWINGS and SHIFTS loads quickly into exact alignment without moving truck from original approach.
Operator SWINGS and SHIFTS loads (forks) while truck is moving—eliminates all lost motion.
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See Your Lift Truck Dealer or Write—

Saginaw sets the pace for industrial casters

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get all the facts about the casters that are engineered for modern material handling . . .

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53

PLEASE SEND ME YOUR NEW ENGINEERING MANUAL NO. C-56

NAME_____

COMPANY_____

ADDRESS_____

Circle 80 on Reader Service Card for more information

tions from 20° to 120° F. have no effect on calibration or zero indicator position, and accurate weighing is provided even when the unit is 10° out of level.

Circle 292 for more information

Automatic Retractable Conveyor Loader

A completely automatic, self-contained conveyor unit, which may be extended through dock doors to permit direct handling through and from trucks, has been introduced by Lance Iron Works. Called the Lanceveyor, the unit is set into the user's present system by means of an automatic control circuit. It extends or retracts automatically, compensating for space changes on the carrier as the load is increased or decreased. It also can be raised or lowered as the work level changes. Another feature is control of belt speed to synchronize with plant conveyor pace, with an automatic safety shutoff at the loading end. The Lanceveyor may be had as a unit for integration into present systems, or as a part of a complete Lance conveyor system.

Circle 293 for more information

Prints Labels As You Need Them

Weber Marking Systems, Division of Weber Addressing Machine Co., Inc. announces its new Model 80 Label Printing Machine which permits users to print their own product and content identification labels as they need them. The unit produces 105 labels per minute complete with variable information, yet is no larger than an electric typewriter. It prints form inexpensive rubber plates made to the user's specifications. The machine is dual purpose. Its printing head, including fountain, can be removed and a stencil printing drum substituted, for printing labels, packing slips and other small forms.

Circle 294 for more information

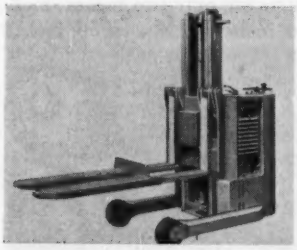
Straddle Carriers Now Have Power Train

Clark Equipment Company's new TransVerter, a power train package consisting of torque converter, hydraulic disconnect clutch and standard transmission, is now standard equipment on the Series 100 Clark-Ross straddle carriers, and is available optionally on the Series 93 carriers. Operational advantages of the

TransVerter include elimination of engine stalling and lugging, sharp reduction in gear shifting, and fine inching control by simply working the throttle.

Circle 295 for more information

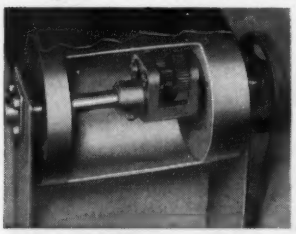
Powered by Engine-Generator Unit



Yale & Towne Manufacturing Company has revealed the development of a new Warehouser, powered by an engine-generator unit, and designed specifically for the heavy ampere draw of long runs and ramp work. Use of the engine-generator instead of a battery enables the truck to operate over long shifts of operation, without the need for recharging or the utilization of prohibitively large batteries. The engine-generator unit fits into a medium sized battery compartment of the standard Yale Warehouser, sacrificing none of the truck's narrow aisle working ability or smooth operation.

Circle 296 for more information

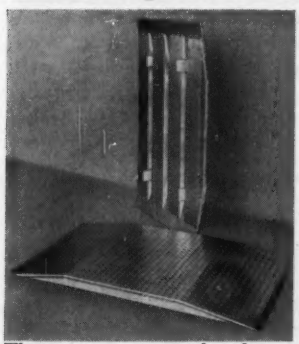
Simplifies Conveyor-Elevator Drive



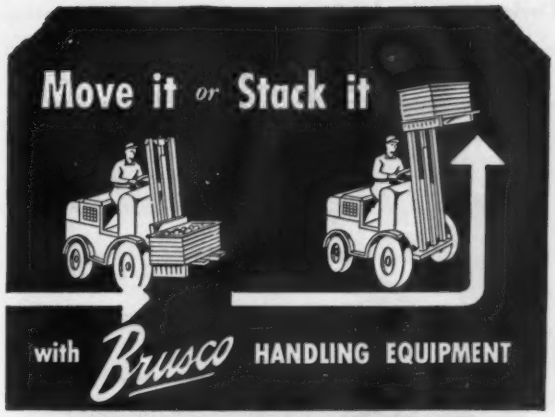
A new type drive, manufactured by Bunke-Musser, Inc., is designed to simplify construction of conveyor-elevators, allowing them to be narrower and eliminating overhang on the drive side. Called the Concentro-Drive, the unit contains the gear reduction mechanism inside the pulley, where it is out of the way and lubricated for life. Variable speeds are easily obtained, by mounting the motor, equipped with a variable pitch pulley, on a sliding base.

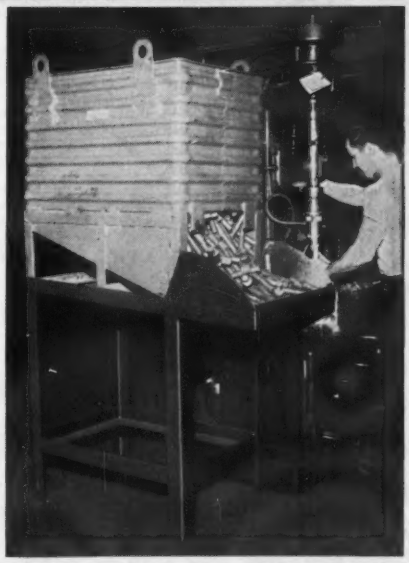
Circle 297 for more information

Flat Car Apron for Piggy Back



The Lite Line Industries Division of Copperloy Corp. has designed a new flat car apron, for use as bridging between flat cars in truck-rail piggy back operations, or for other applications where light weight bridging is necessary for the movement of heavily loaded vehicles. The aprons are made of magnesium, and weigh less than 100 pounds each. They are readily portable, and can easily be positioned by one man. The use of a new





NO. 600 BRUSCO-MATION PARTS BOX PUTS AUTOMATION INTO PARTS HANDLING

For years Brusco Boxes have helped set the pace in the trend to "Automatic Flow".

The No. 600 Brusco-mation Box is just one example of really doing a parts handling job in industry. In this case Brusco design was applied to supplying operator with a steady flow of parts at his working level. The result was greatly reduced handling costs and speeded production. Brusco engineering and design can also solve your parts flow bottle neck and in many cases increase flow in an already efficient production line.

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BRUSCO self dumping hoppers

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Brusco HANDLING EQUIPMENT

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Stop dangerous handling of INDUSTRIAL LIQUIDS

You can stop dangerous handling of liquids with Tokheim high vacuum pumps. Their use in maintenance work will help prevent spilling, slopping, over-filling and dripping—all enemies of safety. This means your plant can be kept cleaner—work is speeded—waste halted—accidents prevented.

Tokheims are available with hose or spout outlets and other optional attachments. Pump operates on both forward and back strokes—delivers 20 gallons a minute. Will pump 'most anything that pours. Offered with alternate parts to handle special liquids.

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New... MODULE SYSTEM

STAND 3 PAN SIZES

THESE INTEGRATED UNITS

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BATHEY MFG. CO.
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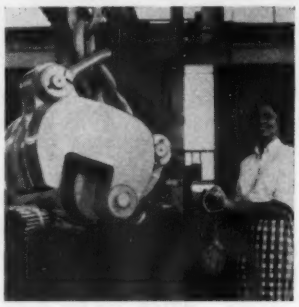
magnesium welding process makes possible a unique design that will support an axle loading of 50,000 pounds, although the ramps are only two inches thick. The standard size is 30 inches wide and 56 inches long, although other sizes are available.

Circle 298 for more information

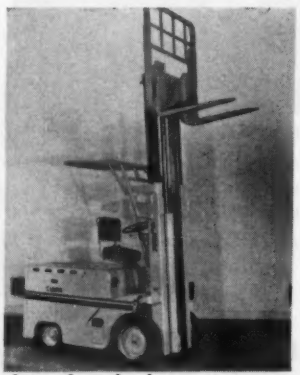
Largest Steel Plate Clamp



A huge-sized steel plate lifting clamp which was specially designed by the Kensico Manufacturing Co., is said by the firm to be the largest of its kind. Employing the same design features as Kensico's conventional Never-Slip clamp, the unit will safely lift a load of 80,000 pounds. Like the smaller models, it has serrated-steel jaws operated by the ascent of the load, providing a grip that is directly proportional to the load.

Circle 299 for more information

Adds New Truck to Electric Line



An 8000 pound capacity model with dual drive wheels, the EUT-8024, is the newest addition to Clark Equipment Company's line of battery-powered fork trucks. The truck has a turning radius of 85 inches, has four forward and four reverse speeds, and will travel loaded at 5½ mph and climb a 10 percent grade. Three independent brake systems are used; in addition to the hydraulic brakes, a "deadman" brake stops the unit when the operator leaves the seat. Also, a switch operated by the brake pedal cuts off power to the motor when hydraulic brakes are applied.

Circle 300 for more information

Pallet Truck Has High Floor Clearance

Completely new link action of Lift Trucks, Inc's "K" Hydrolectric pallet truck gives the unit enough floor clearance—even at critical spots—for extreme operating conditions. In order to lessen pallet damage because of failure to completely lower the forks, the Hydrolectric is designed with a special automatic

lowering control, which drops the forks to the lowered position when the weight is released from them. The same device also permits the load to be lowered gradually to the floor.

Circle 301 for more information

Aluminum Conveyor Is Non-Rusting

The M-H Standard Corp. has developed a new aluminum alloy Armorbelt Conveyor, for applications where the metal belt must be non-staining, rust resistant, light weight or have a bright surface. Aluminum Armorbelt is manufactured in widths from 12 to 60 inches, and in lengths up to 200 feet. All fixed and variable speeds are available, up to 60 feet per minute. Spotwelded aircraft type construction is used, and enameled steel or aluminum alloy frames are available. The unit features standardized interchangeable frame and belt sections, and can incorporate vertical curves for multilevel operation.

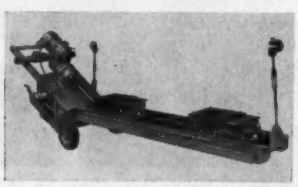
Circle 302 for more information

New Truck-Mounted Crane Available

Announcement of a new truck-mounted crane having wide application in the construction and material handling fields has been made by Coles Cranes, Inc. Designated as Model L-1510, the new crane will lift 15 tons at a 10 foot radius with a 30 foot boom, and is mounted on a specially engineered crane carrier. Basic design follows the Coles' gas or diesel-electric principles, but two-line hoisting is now available, and each line can be operated independently from a separate drum. Both drums may be operated simultaneously, and are equipped for power or gravity operation .

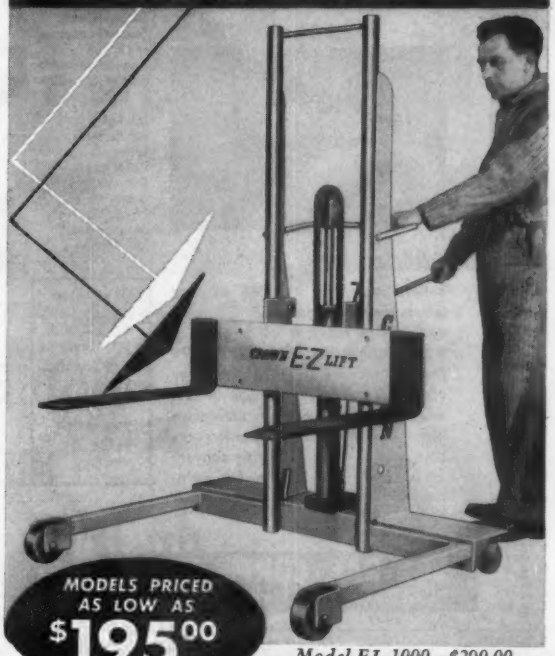
Circle 303 for more information

Unloads Airslide Cars



Sprout, Waldron & Co., Inc. has announced the manufacture of the Portaflow, a new portable unloader which attaches to the outside of airslide cars to convey such materials as are handled by airslides. The Portaflow has a variable speed drive which makes possible a mechanical adjustment in the feed rate from the out-

CROWN® MODEL FL-1000
E-Z FORK LIFT



MODELS PRICED AS LOW AS **$195.00**

Model FL-1000—$290.00
F.O.B. New Bremen, Ohio

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Narrow Aisles . . . Production Areas . . .
Loading, Unloading, Stacking, Positioning

Easily operated and maneuvered by one man in narrow aisles and cramped locations.

Rated capacity 1,000 pounds.* Maximum lift 54" —Lowers to floor—Straddle capacity 38".

Safety overload release and foot-operated brake.

4" by 24" forks—Adjust quickly from 36" to 24" spread. (Sliding adjustable forks available.)

Quickly and easily converted to table lift with Crown "Snap-On Safety Platform."

Smooth, dependable, manually operated hydraulic lifting mechanism.

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Model LT-1000—1,000 pound capacity table lift
Model LT-500—500 pound capacity table lift

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Special lifts engineered to your specifications.

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gives complete production data continuously . . . automatically

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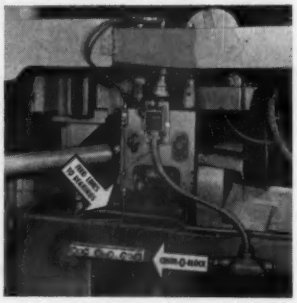
Circle 37 on Reader Service Card for more information

let of the car, insuring a constant flow into the bulk containers. A positive clamp and turnbuckle arrangement attaches the whole assembly to the frame of the airslide car, overcoming any possibility of leakage during unloading. Also, the unit has its own valves for regulation of air flow to the airslide. It is mounted on an aluminum frame, and is available for both three and four inch diameter conveying lines. According to the manufacturer, unit is capable of delivering capacities in excess of 17 tons per hour.

Circle 304 for more information

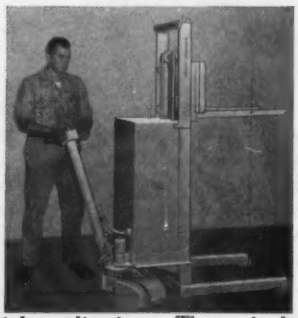
Centralizes All Grease Fittings



Even the smallest machine units can be completely lubricated quickly, with a new centralized lubrication system developed by Lincoln Engineering Co. The system consists of one or more manifold blocks, threaded for insertion on standard hydraulic grease fittings. Rigid or flexible feed lines connect bearings to inlet ports on the manifold blocks. Fittings can be contacted by any standard application device, such as level guns, bucket pumps or power lubricators.

Circle 305 for more information

New Walkie Lift Truck Unveiled



Completely new mobile fork lift truck, the Tubar-lift Champion Stroller, has been introduced by Uhrden, Inc. Designed to elevate loads up to 1000 pounds at lifting heights up to 60 inches, the new walkie is designed with advance safety features to fit a wide range of industrial applications. The unit is equipped with dual lifting chains, and a 12 volt electrical system with built-in battery charger. It has an overall height of 73½ inches, length of 53 inches and width of 30½ inches, with 25 inch forks and a maximum lifting speed of 33 feet per minute.

Circle 306 for more information

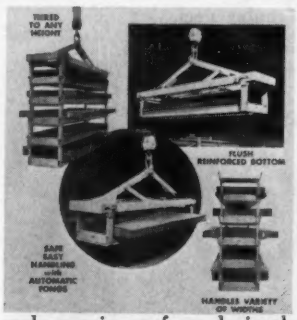
Air Force Blue Stencil Spray

Reynolds Ink, Incorporated has added a new color —Air Force Blue—to its line of stencil inks packaged

in spray cans. The ink is waterproof and weatherproof, and conforms with Government Specifications TT-1-00558a. It is quick drying, and tests indicate that from 100 to 130 average three-line stencils may be obtained from one 12-ounce can.

Circle 307 for more information

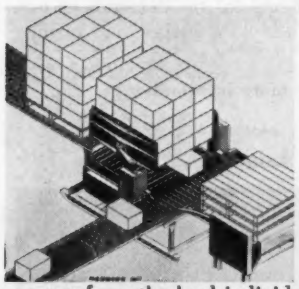
Portable Sheet Steel Racks



Portable heavy-duty sheet steel racks, designed to handle and store sheet steel with an overhead crane, have been introduced by Palmer-Shile Company. The racks are picked up by automatic tongs suspended from the crane, making tiering, storing and carrying safe and simple. The racks have flush bottoms, with reinforced cross bars welded to the frame, permitting the sheets to nest snugly. Each individual rack is easily accessable.

Circle 308 for more information

Unloads Pallets Case-By-Case

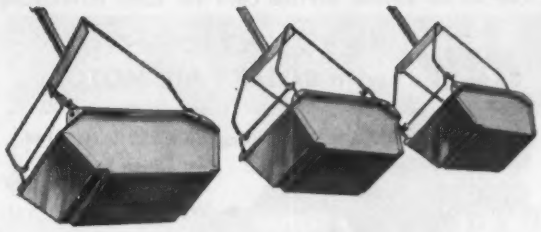


A new automatic pallet unloader developed by the Alvey Conveyor Manufacturing Co. is designed to receive pallet loads of cases and automatically unload them onto a conveyor line. Called the Alvey De-Palletizer, the unit moves cases away from the load individually, in single file, at a rate of 25 to 30 cases per minute. The incoming line, on which the pallets are deposited, may be custom designed to specific installation requirements, long enough to provide loaded pallet storage if necessary. The off bearing line can also be designed to suit special plant needs.

Circle 309 for more information

Permits One-Man Moving

The Saf-T-Lift Co. has perfected a new kind of hoist designed specifically to allow one man to lift a piece of equipment up to 16 feet long and weighing up to a ton, and roll it from one place to another. The hoist is said to make most refrigeration and air-conditioning equipment portable. A unique cable arrangement renders the hoist completely safe to use, in that the heavier



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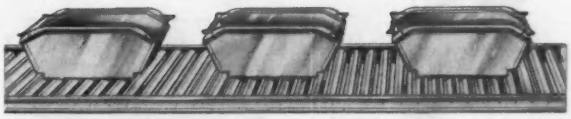

BRINGS YOU

small parts handling efficiency AT NEW LOW COST!

Here's a new addition to the NesTier line . . . to give you new savings in handling small and medium parts. Completely redesigned, "General Purpose" materials handling boxes and baskets are priced one-third lower than other NesTier containers, yet incorporate all of the exclusive cost-cutting features that have been proven throughout industry.

Nesting-stacking feature . . . double hopper ends . . . twin movable handles combine to produce a standard container for use throughout the plant. Five sizes are available in both boxes and baskets.

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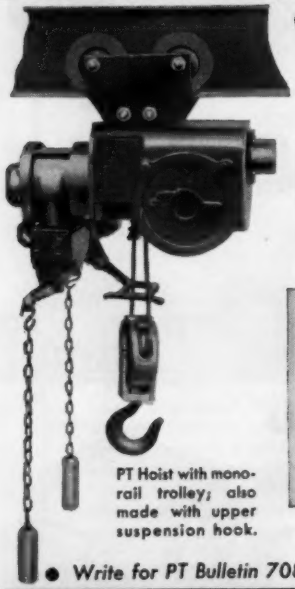
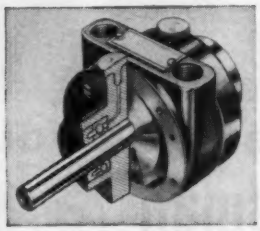
Circle 25 on Reader Service Card for more information

NEW! PNEUMATIC HOIST with ROTARY AIR MOTOR



Capacities 250 lbs. to 1 Ton
Fast Lifting Speeds

- Worm Geared
- Compact—Light Weight
- Exceptionally Smooth Running
- Close, Sensitive Control



PT Hoist with monorail trolley; also made with upper suspension hook.

Pulseless, rotary air motor; no pistons, no reciprocating parts.

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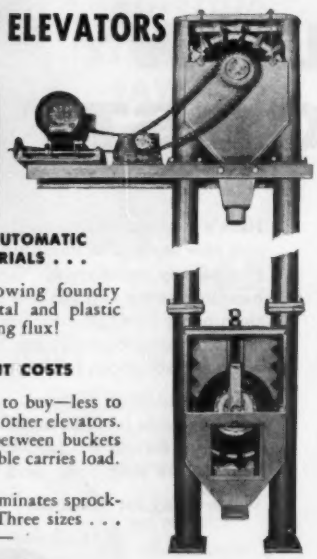
NOW! Hapman HI-LIFT CABLE-VEYOR* ELEVATORS

offer a new

LIFT FOR YOUR PROFITS



. . . NEW ECONOMY IN AUTOMATIC HANDLING OF BULK MATERIALS . . .

Ideal for elevating free-flowing foundry sand, chemicals, foods, metal and plastic powders, gravel, coal, welding flux!

NEW DESIGN FEATURES CUT COSTS

Hi-Lift simplicity costs, less to buy—less to operate. Far fewer parts than other elevators. No rivets, bolts, fasteners between buckets—long-lived flexible steel cable carries load. No chains!

Simple rubber-tired drive eliminates sprockets. Various bucket styles. Three sizes . . . two speed ranges. *Investigate—*

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Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN
In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

Circle 35 on Reader Service Card for more information

NEW EQUIPMENT SECTION

the equipment and the higher it is lifted, the tighter it is gripped. Overall width of the Saf-T-Lift is 18 inches; height is 22 inches. It is light enough to carry, and comes equipped with 25 feet of airplane cable with a loading capacity of 4700 pounds. The frame is made of 1-inch tubular steel.

Circle 310 for more information

Introduces Pneumatic-Tired Gas Truck

The first model of its new line of gas-powered, pneumatic-tired fork lift trucks has been introduced by Baker-Raulang Company. Designated as Model FGF-40, the new 4000 pound truck features high maneuverability due to short turning radius and power steering, provisions for optional dual or single drive wheels, and an extra powerful engine for the demands of outdoor work. Overall length is 85¾ inches, and turning radius is only 79 inches.

Circle 311 for more information

For Lifting Bulky Loads

A light-weight Lift Gate model is now available from Anthony Co., for large trucks handling light but bulky loads. The gate has a loading area of 82 x 30 inches, and a lifting capacity of 1000 pounds. One hydraulic cylinder does the lifting and lowering, and is powered either by a battery-powered pump or a power take-off and pump combination. Loading and unloading can be done from the side even at curb level. The lifting and lowering operations are controlled by a single lever from either side of the truck. The gate stops automatically at ground and truck levels, or can be stopped and held at any intermediate height.

Circle 312 for more information

Improved Models of Conveyor Lubricators

New and improved models of its 100 and 700 Series conveyor lubricators have been introduced by J. N. Fauver Co., Inc. The 100 Series, for trolley chains, slat-type conveyor bearings and hot zone applications, has been modified to economy of space through the use of an aluminum housing. Improved filters and

regulators are also utilized, as well as redesigned trip mechanism that actuates a hunt valve. The 700 Series features an improved air control panel, filter, regulator and lubricator. It also employs a non-drip nozzle with automatic shut-off, and has provisions to handle wheels of different manufacturers on the same conveyor chain.

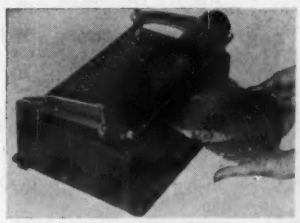
Circle 313 for more information

Designed for Flat Objects

A new hand truck, especially designed to handle large, flat crated case goods such as glass, sheet metal, plywood and similar materials, has been developed by Rol-Away Truck Manufacturers, Inc. The method of loading is the most important departure in the design of the Model A-B truck. The upper structure tilts forward without the rear wheels lifting from the floor. The load is then tilted back to any desired slant, and held at that angle by means of adjustable set screw stops. Because of the slant of the load, much wider cases can be carried than with former models. Cases up to 18 inches in width and up to 2500 pounds in weight are handled by one operator.

Circle 314 for more information

Seals Both Plastics and Barrier Materials



A new, semi-automatic heat sealing machine, capable of sealing unsupported plastic films such as vinyl and polyethylene as well as most coated and laminated barrier materials, is now available from Product Packaging Engineering. Suitable for both industrial and consumer applications, the Model 54UL utilizes a heated platen in conjunction with a Teflon-Fibreglass clamping pad. Pre-set dials for heating and dwell cycles eliminate the possibility of operator error, and an electro-mechanical lock makes it impossible for the operator to interrupt the sealing cycle. The heating platen may be released at any time.

Circle 315 for more information

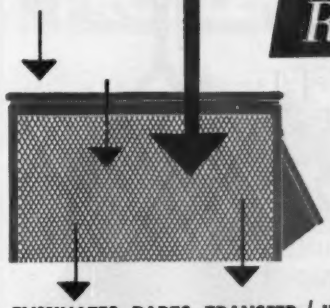
Extra Safety for LP-Gas

A new compact LP-Gas Strainer and Fuelock, providing extra safety when motorized equipment is not in use, is introduced by Century Gas Equipment Co.

NEW VERSATILE

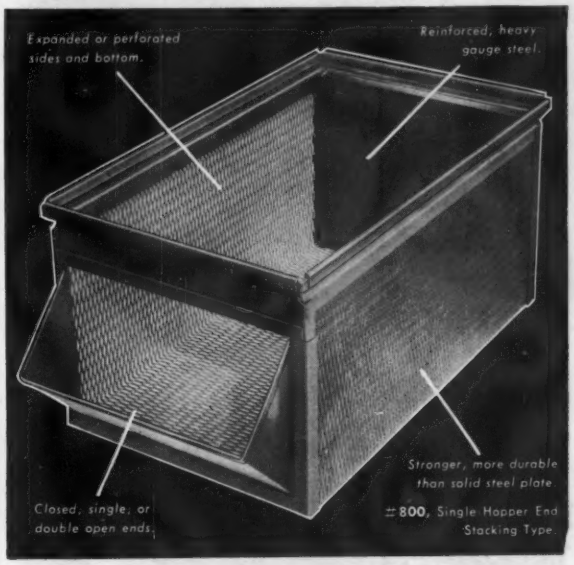
RANtote

EXPANDED METAL STACKING BASKET



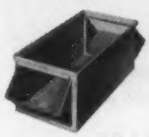
ELIMINATES PARTS TRANSFER / IDEAL FOR DEGREASING,

Dipping, Plating, Cleaning, Parts Storage, and all general small parts handling.

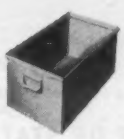

Expanded or perforated sides and bottom.
Reinforced, heavy gauge steel.
Stronger, more durable than solid steel plate.
Closed, single, or double open ends.
#800, Single Hopper End Stacking Type.

LOWER COST / LESS WEIGHT / GREATER VISIBILITY

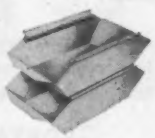
Available in all RANtote sizes and styles.



#801
Double Hopper Ends Stacking Type.



#805
Closed End Stacking Type.



#877
Stacks/Nests. Nested boxes can't jam or stick. Saves space.

RANtote Expanded Metal Basket container eliminates changing containers for degreasing and other operations. Use it with increased economy for your entire production cycle — receiving — production — cleaning —storage — assembly and shipping WITHOUT PARTS TRANSFER ! Available in these four styles in a wide range of sizes for all handling requirements. Special sizes in quantity orders made at LOWEST COST.

Write today for prices and specifications

RANdolph INDUSTRIAL EQUIPMENT CO

Dept. FC, 9559 West Grand Avenue, Franklin Park, Illinois

Circle 75 on Reader Service Card for more information

Circle 163 on Reader Service Card for more information

NEW...

RUGER
CONVERTIBLE
QUARTER-TONNER
Well can be moved to truck body by removing four bolts. Entire truck crane assembly weighs only 100 pounds.

LOW COST-LARGE PERFORMANCE

An extra bonus piece of equipment—this new Ruger Floor Crane converts easily to a truck crane. Other models are available in capacities to three tons in floor cranes, two tons in truck cranes.

WRITE:
Ruger Cranes — 601 West Fourth Street, Uhrichsville, Ohio

Pack, Inspect and Assemble

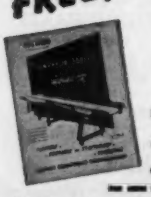
SPEEDS UP PRODUCTION

An all-purpose portable belt conveyor, work table and straight-line production system, with and without side leaves. Available up to 100 ft. long in 10 ft. easily assembled sections.

PORTABLE OR STATIONARY

The perfect mechanized table for assembly, inspection and packaging operations. Available in steel or stainless steel with fixed or variable speed.

FREE!



ISLAND EQUIPMENT CORP. Dept. F-1
27-01 Bridge Plaza North
Long Island City 1, N. Y.

Please send Bulletin 1P-1 on Island Unitized Conveyor Tables.

NAME_____

ADDRESS_____

CITY_____ STATE_____

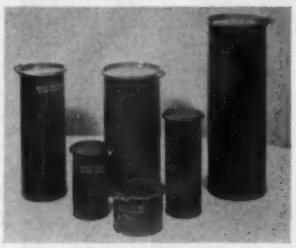
Circle 47 on Reader Service Card for more information

NEW EQUIPMENT SECTION

The conventional Fuelock is mounted on a smaller sediment bowl, making the unit suitable for applications in limited space, such as fork trucks and tractors. The Fuelock valve at the top of the strainer bowl operates by a magnet, and locks off the gas line when the ignition is turned off.

Circle 316 for more information

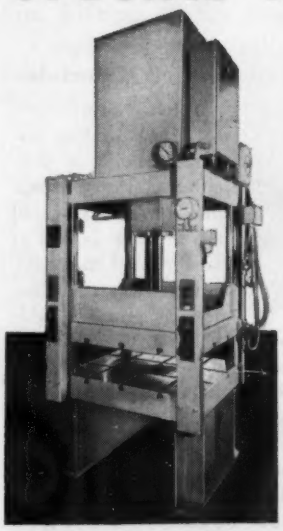
Non-Standard Cans Cut Costs



Sturdy, re-usable shipping containers in a wide range of non-standard body heights are offered by George D. Ellis & Sons, Inc. The containers are designed to meet the demands for extra height containers for packaging items which have relatively small diameters in relation to their over-all length. According to the manufacturer, they eliminate the need for interior cushioning and exterior crating. The cans are produced in diameters of 5, 6½ and 8½ inches, and in body heights from 3 to 60 inches. Tops are fastened securely by a lock-ring bolt.

Circle 317 for more information

SPECIAL MACHINES



One of 5 - 25 ton hydraulic presses machined and assembled by Composite Forgings.

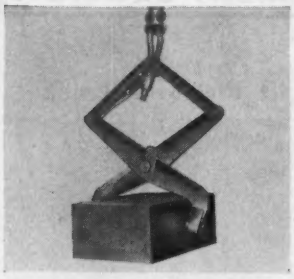
To fill your commitments on time . . . economically and accurately . . . Our exclusive Weldment construction assures ruggedness and durability...easy modification to other requirements. Eliminate pattern cost.

Consult . . .

COMPOSITE FORGINGS, INC.
2300 W. JEFFERSON, DETROIT 16, MICH.
Phone TAshmoo 5-3226

Circle 99 on Reader Service Card for more information

General Purpose Automatic Tongs



Development of two sizes of general purpose automatic tongs has been announced by Heppenstal Company. Based on the company's familiar die-block tongs, the new tongs are designed for lifting various square, round or rectangular objects. One pair has a maximum jaw opening of 18½ inches, and has a capacity of 3000 pounds. The other, designed for loads up to 5000 pounds, has a jaw opening of 25 inches. The new tongs have so many applications that they are being manufactured on a production basis, and are kept in stock for immediate delivery.

Circle 318 for more information

Multi-Purpose Truck Leader

Hydraulic truck loader that operates as a complete unit with one man and one machine is the new multi-purpose LoDal that has a wide use in industry, municipalities, construction, etc. Manufactured by LoDal, Inc., the truck has a 3000 pound capacity and loads one truck or many. Possible are loading speeds up to two yards per minute in heavy material. The loader fits most trucks from 1½ to 4 tons capacity, with special models for trucks over 4 tons, says the manufacturer. The truck loads itself and in addition, the forward tilting bucket provides for loading other trucks.

Circle 319 for more information

New Power Trolley

A low cost motor driven auxiliary to small intermittent use chain or wire rope electric hoists has been introduced by Bacon Crane & Hoist Corp. The unit receives its drive through a right angle gear reducer, and the motor is totally enclosed. Available in 1 or 2 ton models, these trolleys operate at 65 feet per minute, and are adjustable for most beams. Each unit is furnished with a 4 button station incorporating both trolley controls, and the push button circuit is reduced to 24 volts for maximum safety.

Circle 320 for more information

HEAD CLEARANCE PROBLEMS . . . . . ?

your answer is

MULTI-LIFT

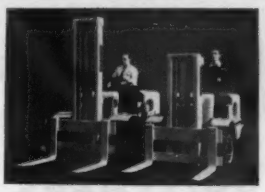
by truck-man

STARTS LOWER • LIFTS HIGHER • FOR LESS

If you have a low door, low passageway or other confining area that makes it tough to use a fork lift truck, Truck-Man's new Multi-Lift Mast will solve your problem.

- LOWEST DOWN HEIGHT—Only 72" for a full 144" lift—62" for 120" lift—others available.
- INCREDIBLY SIMPLE— no latches, ratchets or complex mechanisms.
- NOT HIGH FREE LIFT—but in most cases it takes the place of HFL and, at much lower cost.
- IMPROVED VISIBILITY—through the mast, below eye level when lowered.
- AVAILABLE NOW—on all Truck-Man indoor and yard high lift models.

COMPARE DOWN HEIGHTS!



For 144" lift; conventional mast (left) has down height of 92" vs. only 72" for Multi-Lift mast (right). For 120" lift, conventional mast has down height of 83" vs. 62" for Multi-Lift.

Write today for your copy of the folder describing the revolutionary new Multi-Lift mast.

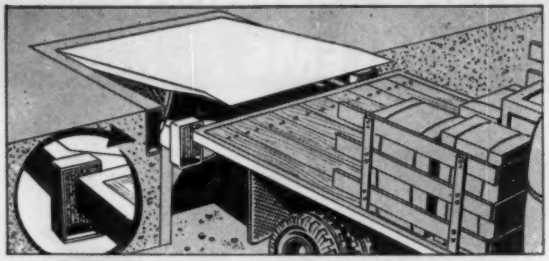
truck-man DIV. OF THE KNICKERBOCKER CO.

582 LIBERTY ST. • JACKSON, MICHIGAN

Circle 141 on Reader Service Card for more information

Circle 55 on Reader Service Card for more information

SAFE AUTOMATICALLY



RITE • HITE AUTOMATIC TRUCK RAMP

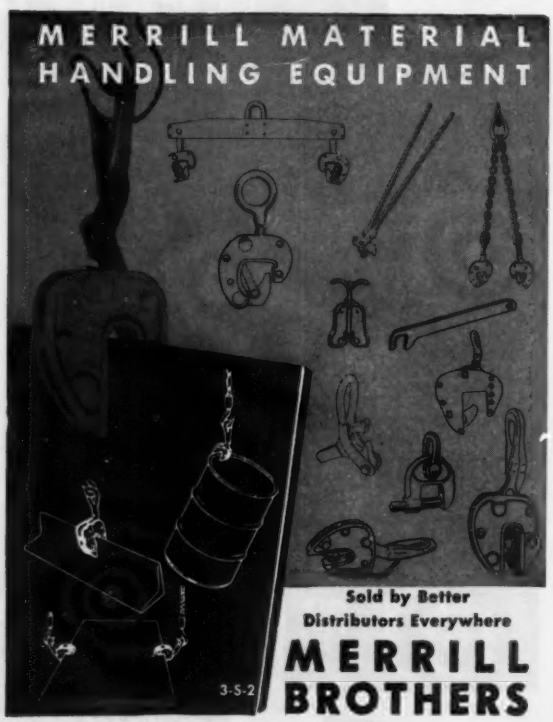
- **NO ATTENDANT NEEDED.** Automatic leveling of ramp removes "human element" and chance of accidents.
- **NO HEAVY ARMS OR LEVERS.** Possibility of strains and ruptures eliminated. The truck does all the work.
- **NOTHING PROJECTS ABOVE DOCK FLOOR** to trip walkers or damage fork trucks.
- **UNBALANCED 20,000-POUND LOADS CARRIED SAFELY.** Rite-Hite platform supports capacity 20,000-pound load.
- **NO COMPLICATED MECHANISM OR CONTROLS** to fail and cause trouble. Rite-Hite has simple, precision counterbalancing.

For automatic safety, for automatic savings—investigate Rite-Hite *first*. Write today for details, Dept. F-17

RITE-HITE DIVISION

LOOMIS MACHINE COMPANY
133 East Fourth St., Clare, Mich.

MERRILL MATERIAL HANDLING EQUIPMENT



Sold by Better Distributors Everywhere

MERRILL BROTHERS

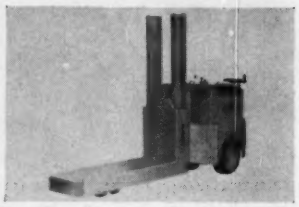
For Interesting Information write

56-74 ARNOLD AVE., MASPETH, N. Y.

Circle 62 on Reader Service Card for more information

NEW EQUIPMENT SECTION

Introduces High-Lift Platform Truck



A new 10,000 pound capacity, electric high-lift platform truck, designed for general rugged handling operations, has been developed by the Elwell-Parker Electric Company. Known as the E13-10, the unit features two-wheel drive, six-wheel steering, is hydraulically actuated and is of end-control, stand-up, non-telescopi-type.

Circle 321 for more information

Prevents Packages from Slipping

A new friction coating for cartons, multiwall bags and other paper containers has been introduced by International Products Corp. Invisible Sand decreases slippage so that loads will not shift in transit or storage. Provided as a concentrate, Invisible Sand is applied with brush or roller. It is not a glue, and will not stick packages together.

Circle 322 for more information

IRONBOUND SKIDS

Full range of sizes, types, capacities, underclearances!

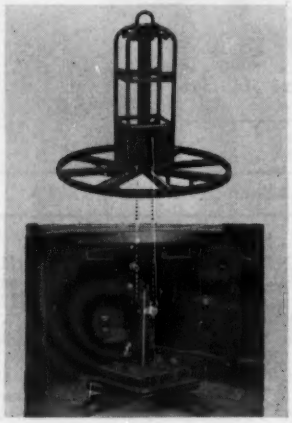
Bolted and welded construction of C-type skids feature easy deckboard replacement.

Ironbound — **IRONBOUND**

30 Hoffman Place • Hillside, N. J.

Circle 326 for more information

Steel Coil Handling



A newly designed reel and stand for handling coils of steel, is being manufactured by Palmer-Shile Co. The reel and stand provides a simple, cost saving rotary device to reduce down time on production machinery by direct feed of coil from reel. The unit provides convenient space-saving coil storage and is easy to transport, lifts by fork truck or crane, and is all welded steel construction.

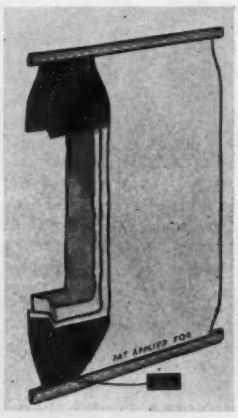
Circle 323 for more information

Self-Propelled Yard Crane

The production of a new ½ yard self-propelled yard crane has been announced by Little Giant Crane & Shovel, Inc. This single engine crane is equipped with hydraulic servo steering, hydraulic power brakes accompanied with spring load power brakes, and 2 speed 4 wheel drive. Designed for work in cramped quarters, the unit will turn in less than a 60 foot circle. Shafts on the upper unit rotate on roller bearings sealed for life. The unit can be equipped with a precision high speed, power up power down boom hoist. Engineering conforms with existing highway load limits.

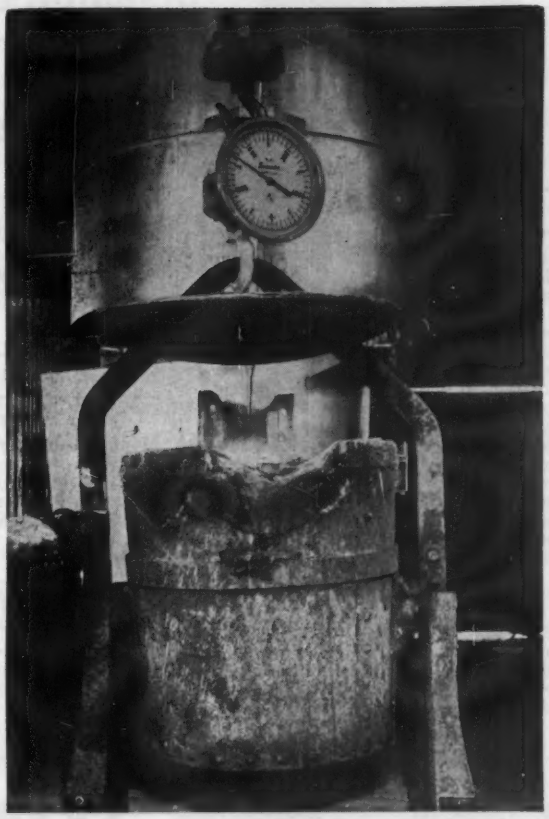
Circle 324 for more information

Strength-End Multiwall



A new sewn multiwall paper shipping sack featuring reinforced end construction is being produced by Bemis Bro. Bag Co. The new bags, called "Strength-end", are reinforced with strips of kraft paper between plies at the bag's top and bottom. With this construction feature, packaging efficiency can be improved in two ways, according to the manufacturer. Either it may be used to increase bag strength at critical points, at less cost than adding an additional ply of paper.

Circle 325 for more information



HOW TO POUR CASTINGS WITHOUT GUESSWORK

This steel foundry is using a Martin-Decker SU-20 Sensater hook scale to weigh the molten metal as it pours into the ladle. This way they use only the steel needed for pouring a specific number of castings without risking the expense of running short or having an overage. In the application pictured here, a steel, asbestos-insulated shield protects the Sensater from the intense heat.

This is but one of the hundreds of uses for the versatile Sensater, the only hydraulic crane scale accurate enough to be certified, yet rugged and compact enough to meet industry's exacting demands.

For full particulars, write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. N-17.

MARTIN·DECKER CORP.

HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

Circle 165 on Reader Service Card for more information

CLASSIFIED ADVERTISING SECTION

USED EQUIPMENT—MEN—JOBS—LINES

Rates: for "Positions Wanted" $8.00 minimum, limit 25 words. For all other classifications $10.00 minimum for 25 words; each additional word 25c. Boldface type or all caps, $12.00 minimum for 25 words, each additional word 35c. Box address counts as five words. All insertions payable in advance.

HELP WANTED

Conveyor manufacturer seeks regional sales manager to be responsible for sales, field engineering and installation of conveyors in the Eastern United States. Position requires graduate engineer with at least ten years of significant industrial experience, including either sales or engineering experience in the material handling field. This position offers a challenge to the individual as there is an almost unlimited opportunity for expansion of our product. Current organization expansion makes this opportunity available at this time. For further information please send resume to Box 1357, FLOW.

SALESMAN: Unusual opportunity for two men under 35. Experience in direct sales, in the selection of distributors, and training of distributor's salesmen in product knowledge and sales techniques. Majority of time will be spent on direct sales. Openings in Middle West, Middle Atlantic, and Eastern regions. Top earnings available to right man. Our men know of this ad. Write to FLOW, Box 1257.

LINES WANTED

EXCEPTIONAL

Manufacturers' Agent covering Mass. —R. I., seeks exceptional materials handling equipment, quality products at competitive prices, to promote and sell. Prefer the unusual. Write FLOW Box 1157.

DISTRIBUTORS WANTED

Complete line industrial electric trucks. Old name in field. Large list of satisfied users. Bowers Industrial Electric Truck Co., P. O. Box 4, Reading, Pa.

REPRESENTATIVES WANTED

MANUFACTURER NEEDS

AGENTS! DISTRIBUTORS! REPRESENTATIVES! to represent rapidly expanding line of ADD-A-TIER STEEL SHELVING; PARTS BINS, INDUSTRIAL 2-WHEEL HAND TRUCKS, PLATFORM AND BOX TRUCKS, DOLLIES AND SHOP EQUIPMENT. Most territories open. Write President, Bernard Franklin Corp., 2900 E. Hedley St., Philadelphia 37, Pa.

WANTED:

MANUFACTURER'S REPRESENTATIVES— FIBRE TOTE BOXES

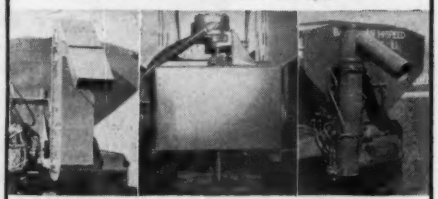
To handle new line of light, one-piece, non-corrosive, hardened fibre tote boxes. Standard and custom sizes. Commission basis. Write, giving experience, lines presently handled and territory covered to FLOW, Box 1457.

it's the New BULKMOBILE

WITH THE SELF-SUPPORTING BULK BODY
THAT NEEDS NO TRAILER FRAME

5 METHODS of DISCHARGE

Belt Conveyor


Belt & Bucket | Distributor | Screw Conveyor

Also by CENTRIFUGAL STACKER

Designed to Carry the BIG Loads . . . at BIG Savings

- All-Hydraulic Operation or Gasoline Engine
- Rapid Discharge
- Compartmented Interior
- Self-Supporting Body
- Roomy Hatches
- BIG Capacity
- With or without Roof

WRITE for new BULKMOBILE Bulletin A-399

BAUGHMAN

BAUGHMAN MANUFACTURING CO., Inc.
106 Arch Street • Jerseyville, Ill.

Circle No. 8 on Reader Service Card for more information

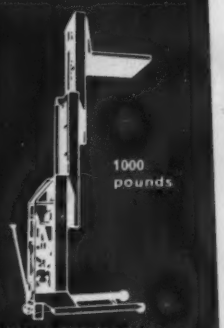
ADVANCED DESIGN!
COMPLETELY EQUIPPED!

COLSON'S NEW, LOW-COST

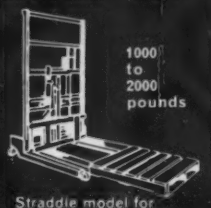
"Half-tonner"

PORTABLE LIFTER

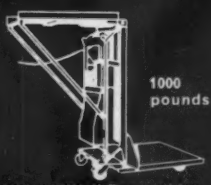
The Colson "Half-Tonner" offers unusual economy and versatility in lifting various materials weighing up to 1000 pounds. This is a ruggedly constructed, narrow-aisle close quarters lifter, capable of doing the many jobs big, expensive heavy duty lift trucks find impractical



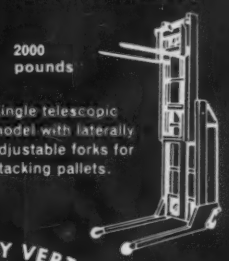
Double telescopic cantilever lifters for extra high lifts.



Straddle model for double faced pallets.



Hinged "Half-Tonner" for low overhead clearance.



Single telescopic model with laterally adjustable forks for stacking pallets.

The heavy duty hydraulic system is actuated by a ¾ horsepower motor, two 130 amp. batteries with built-in 10 amp. charger (standard equipment) or AC-DC line power supply. Designed to 15¾" for very narrow aisle operation. Oversize 8" swivel ball bearing casters and large 5" roller bearing wheels provide easy rolling.

Colson's Standard Features

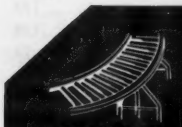
- **extra height—lifts 68¾"**
- **double safety—two heavy duty load bearing chains, each will support full load. Extra rugged construction**
- **side thrust rollers to prevent platform tipping**
- **ball bearing load rollers on platform**
- **safety floor lock**
- **push button control (optional)**

Over 50 standard lifters and capacities . . . and custom built lifters . . . meet any requirement. Consult a Colson materials handling specialist.

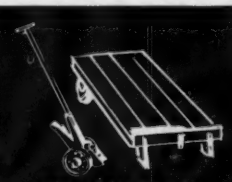
EASY VERTICAL LIFTING

Colson ®

SMOOTH HORIZONTAL ROLLING



CONVEYOR
Aluminum or steel skate wheel or roller gravity conveyor



LIFT JACK TRUCK
No. 6712

DRUM HANDLING TRUCK
No. 6055

IN LINE TRUCK
No. 7010

No. 6-807-195

No. 4-1037

CASTERS No. 6-808-17

Write or phone for recommendation by specialists

The Colson Corporation · General Offices, **Elyria, Ohio**

Factories in Elyria, Boston, Toronto

See us at the Plant Maintenance and Engineering Show, Jan. 28-31, Booth 1108, Cleveland, Ohio

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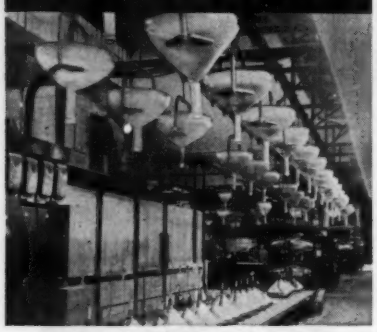
CABLE-LINK PERFORMS



This picture illustrates a solution to a problem presented by a Television Tube Manufacturer—to design and engineer a tube delivery conveyor to the following specifications . . .

★ ***2600 Feet Long***

★ ***Rugged***

★ ***Smooth Operation***

★ ***Single Drive***

★ ***Economical Operation***

★ ***Minimum Capital Investment***

Dearborn Cable Link can do the same for you.

The basic design of Dearborn's system eliminates moving parts below the rail, assures smooth, frictionless, durable performance, and minimum maintenance.

Direct inquiries to factory or your nearest Dealer.

Territories available to qualified dealers.

DEARBORN CABLE-LINK CONVEYOR SYSTEMS

DEARBORN FABRICATING & ENGINEERING CO.

19440 GLENDALE AVE. • DETROIT 23, MICH.

Circle No. 24 on Reader Service Card

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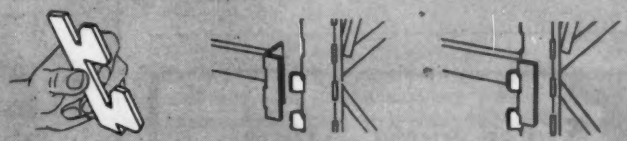

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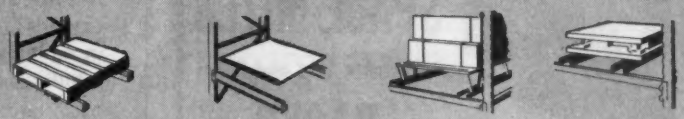

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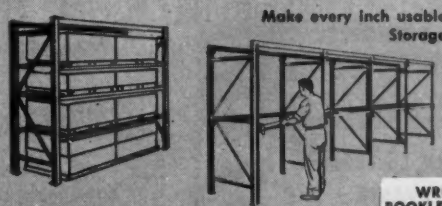

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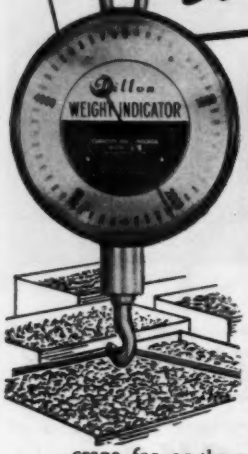

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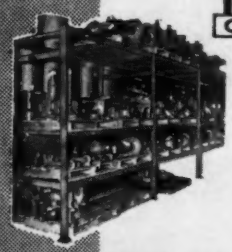

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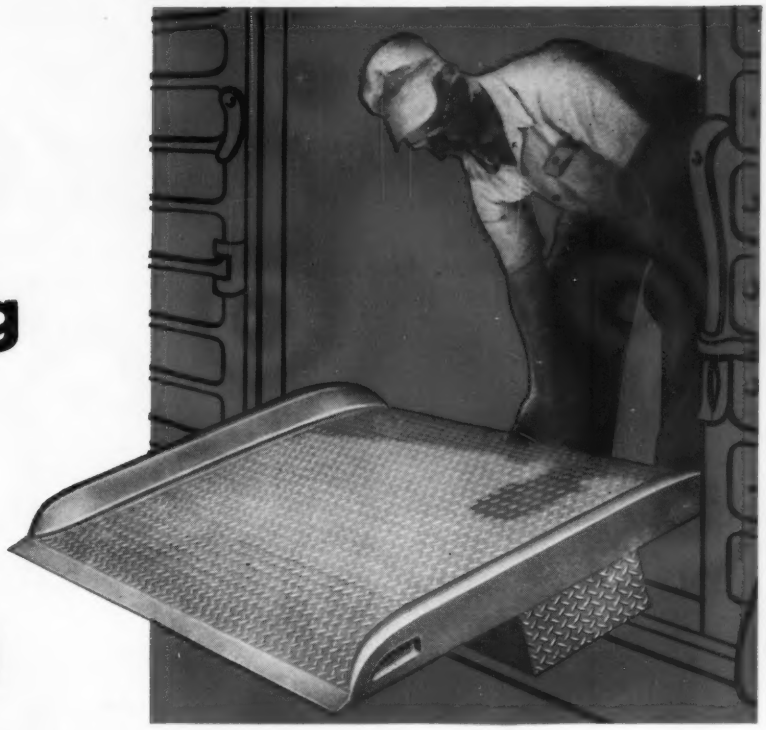

...ONE THAT WILL SPEED LOADING AND KEEP COSTS DOWN. This company has made a wise investment—one which will pay dividends over a long period of time! The man above is putting a Magliner magnesium dock board in place on the company's dock. This new Magliner will speed loading . . . get more out of power trucks and other loading equipment . . . keep costs down. Made of light, strong magnesium, the dock board is easily moved and positioned by one man. No heavy lifting . . . no risk of physical injury, it will protect men, loads and equipment against accidents and costly damage.

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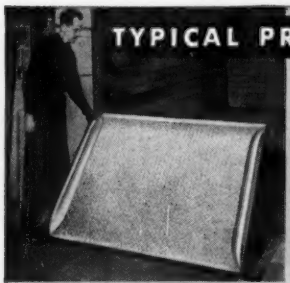

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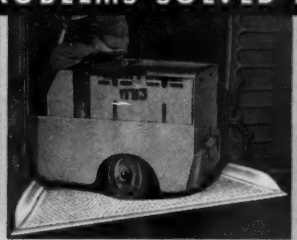

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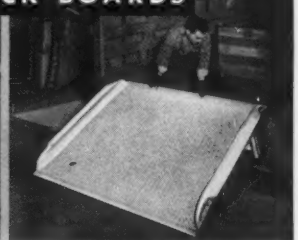

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